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State of Montana



Report to the Legislature

June 1992

## Performance Audit Report

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## Department of Transportation

### Equipment and Motor Pool Programs

This report contains recommendations for improvements to program operations. The recommendations address:

- ▶ Equipment purchasing and fabrication.
- ▶ Selection and testing of department equipment.
- ▶ Motor Pool fleet size.
- ▶ Leasing of Motor Pool vehicles.
- ▶ Equipment and Motor Pool management information systems.

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## **PERFORMANCE AUDITS**

Performance audits conducted by the Office of the Legislative Auditor are designed to assess state government operations. From the audit work, a determination is made as to whether agencies and programs are accomplishing their purposes, and whether they can do so with greater efficiency and economy. In performing the audit work, the audit staff uses audit standards set forth by the United States General Accounting Office.

Members of the performance audit staff hold degrees in disciplines appropriate to the audit process. Areas of expertise include business and public administration, statistics, economics, computer science, communications, and engineering.

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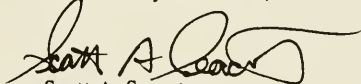
June 1992

The Legislative Audit Committee  
of the Montana State Legislature:

We conducted a performance audit of the Montana Department of Transportation's Equipment and Motor Pool Programs. This report contains recommendations concerning operations of both programs.

We wish to express our appreciation to the Department of Transportation and to field program staff for their cooperation and assistance.

Respectfully submitted,



Scott A. Seacat  
Legislative Auditor



# **Office of the Legislative Auditor**

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## **Performance Audit**

### **Department of Transportation**

#### **Equipment and Motor Pool Programs**

Members of the audit staff involved in this audit were: Lisa Blanford, Dave Gould, C. Susan Jensen, and Kent Rice.



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## **Appointed and Administrative Officials**

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### **Department of Transportation**

John Rothwell, Director

Thomas J. Barnard, Administrator, Highways Division

Gary A. Gilmore, Assistant Administrator, Highways Division

William S. Strizich, Maintenance Engineer

Bruce H. Barrett, Assistant Maintenance Engineer

Marvin Page, Equipment Supervisor

Sue Nichols, Motor Pool Manager



# Report Summary

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## Introduction

Our performance audit concentrated on the Montana Department of Transportation's (MDT) Equipment and State Motor Pool Programs. These programs are administered by the department's Highway Division.

Our audit recommends improvements in the administration and operation of the programs. Corrective action by the Department of Transportation should improve overall effectiveness of the Equipment and Motor Pool Programs. The following sections provide background information and summarize the results of our performance audit.

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## Equipment Program

The Maintenance and Equipment Bureau is responsible for managing the department's equipment fleet. Equipment is rented to various programs within the department. The bureau oversees and provides administrative support services to field equipment operations. It also acquires and distributes new equipment and surpluses old equipment. Field offices are responsible for maintenance and repair of highway equipment. There are 16 equipment maintenance shops statewide.

---

## EMS Usefulness is Questionable

We reviewed the Equipment Management System (EMS) which is used to monitor fleet operations, maintenance, shop performance and production, and financial status. We identified several areas where the EMS could be improved, including: data input and processing, report distribution and staff use of the system. The department should establish appropriate controls over data input, processing and output to ensure data integrity. The department could also improve the effectiveness of the EMS by reviewing and revising the management system to ensure it meets the needs of both central and field management. Training should also be provided to ensure staff understand how to use the EMS.

## Report Summary

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### Equipment Not Meeting Users' Needs

During our audit, we reviewed the MDT equipment selection process. The process consists of identifying needed equipment and equipment to be replaced, and developing bid specifications for purchasing this equipment. We identified several concerns with this process which appear to be related to lack of input from field personnel and a breakdown of communication from headquarters to the field. As a result, the department has purchased equipment which is not effectively used by highway maintenance crews. The department could strengthen the process used to select equipment by obtaining direct input from field staff. Management should also increase communication to ensure both field management and staff are informed of equipment selection decisions.

---

### Testing of Equipment Could Be Improved

We found equipment testing is done informally. There are no documented equipment testing procedures to guide department personnel through the testing process, criteria for test results has not been formulated and documented test results are not required or completed. We could not verify results of testing of any MDT equipment. We also found equipment is not tested under various operating conditions including differing geographical and climatic areas of the state. The lack of formal department equipment testing policies and procedures has adversely affected equipment operations. While the procedures for testing some equipment appear to have been successful, other procedures were not.

The department would benefit from a formalized equipment testing process. Formal procedures would provide testing guidelines for personnel and increase consistency of testing. In addition, management should implement procedures for documenting and reporting test results.

---

### **Need to Adjust Timing of Equipment Purchase and Delivery**

A major responsibility of the Equipment Program is to purchase, prepare, and issue new equipment to MDT field staff. During the audit, we reviewed the timeliness of the department's equipment purchasing and fabrication process. We found approximately \$5.5 million worth of equipment purchased over the past five fiscal years has been idle for between 3 and 15 months before placed into service. Although equipment fabrication and delivery to the field appears to be timely, we found new equipment sits idle for an unreasonable amount of time prior to shop fabrication.

These delays in getting equipment into operation could have significant effects in four areas: 1) additional repairs on old equipment scheduled for replacement, 2) delays in completion of maintenance work, 3) deterioration of new unused equipment, and 4) lost interest earnings.

The department should implement changes to decrease the amount of time between receipt of new equipment and in-service dates. In addition, improved monitoring of the equipment purchase and fabrication process should ensure timely processing of new equipment.

---

### **Untimely Preventive Maintenance**

Equipment Program management established an equipment preventive maintenance (PM) program to maintain the department's fleet. We found preventive maintenance is not always completed according to department policy and, as a result, is completed in an untimely manner. The department should develop procedures to monitor equipment preventive maintenance to ensure compliance with department policy.

---

### **Additional Management Controls Needed**

We examined management controls used by the department in administering the Equipment Program. We identified several areas where management controls could be improved including goals and objectives and staff training. By addressing these areas, the overall management of the program could be improved. Implementation of these recommendations would also

## Report Summary

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provide direction for staff and assist with meeting program intent.

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### Motor Pool Program

The Maintenance and Equipment Bureau is also responsible for administration of the Motor Pool. The Motor Pool operates the state's fleet of rental and lease vehicles available to all state officials and employees. There are approximately 210 vehicles in the Motor Pool fleet which are kept at a centralized location in the capitol complex.

---

### Fleet Above Optimal Size

During the audit, we reviewed the size of the Motor Pool fleet to determine if the department is operating the optimal number of vehicles. Our review revealed fleet size for fiscal years 1989-90, 1990-91, and 1991-92 has been larger than needed to meet demand for Motor Pool vehicles. Planned fleet size for the upcoming fiscal year is greater than optimal size. Excess vehicles result in increased operating and maintenance costs and therefore higher vehicle rental rates. A smaller fleet would be less costly to operate and maintain. In addition, with less equipment in the fleet, there would be less equipment to replace, thus saving capital outlay.

It appears there are several factors which have contributed to excess vehicles in the Motor Pool fleet: 1) staff do not adhere to established department methodology for analyzing and calculating target fleet size, 2) staff are not trained in analyzing fleet use, 3) department management overestimated increased fleet use during fiscal years 1988-89 and 1989-90 and increased fleet size dramatically, and 4) department management is reluctant to reduce fleet size.

The department should analyze vehicle usage and adjust the size of the fleet to more appropriately reflect vehicle use. The department should also establish a documented methodology for analyzing fleet use and determining optimal fleet size. This analysis should: 1) be conducted on an annual basis, 2) assess usage by vehicle type (rather than the fleet as a whole), and 3) be based on average annual daily fleet usage rather than average monthly fleet usage. Incorporating this methodology

would provide a more accurate indicator of fleet use and optimal fleet size. In addition, providing training to persons responsible for assessing use and fleet size would also improve the analysis.

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### **4x4 Rental Rates are Improper**

During our audit we reviewed fleet rental rates to determine if rates appropriately recover associated costs. We found rental rates for the four-wheel drive (4x4) utility vehicles have not recovered costs for four fiscal years, 1988-89 through 1991-92. The department should ensure rental rates for 4x4 utility vehicles are set at an appropriate level.

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### **Lease Vehicles Operations Should Be Improved**

Besides the fleet of rental vehicles, the Motor Pool also leases vehicles to agencies for various periods of time. We identified several areas where documentation, review, and monitoring of vehicle leases could be improved. As a result of these identified concerns, there have been revenue shortfalls for some leased vehicles and excessive revenue collection for others. In addition, staff were uncertain of lease assignments and could not monitor lease vehicle use to ensure minimum usage requirements are met.

The department should adopt procedures to ensure lease files adequately document vehicle assignments and support lease rates. In addition, periodic monitoring of leased vehicle expenses and rates would ensure recovery of vehicle costs. Examination of use would also assist in assuring leased vehicles are efficiently used.

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### **Inadequate Motor Pool Management Information**

During our audit we reviewed management information used in administering Motor Pool operations. Information pertaining to fleet operations is compiled both manually and by a computerized information system, the Motor Pool Management System (MPMS).

We found information contained on the management information system is incomplete and inaccurate. We also identified incorrect criteria used to generate a computer report. In addition, there were numerous reports produced by MPMS which are not used by staff. Discussions with staff indicated they were not fully aware of how management reports should be used and expressed

## Report Summary

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a reluctance to use the reports. We also found reports are not always distributed to appropriate staff.

As a result of these concerns, the MPMS is not used to its full potential. This makes it difficult for management and staff to fully assess Motor Pool performance or to determine whether the fleet is properly maintained and used. Our review indicated the department would benefit by reassessing the MPMS to ensure it meets the needs of Motor Pool management and staff and produces relevant data. Proper distribution of related reports would assist with managing operations. Staff training would provide staff with an understanding of the system and how information produced by MPMS can be used in daily operations of the Motor Pool. A users manual would provide staff with additional information to assist with use of the management system.

The department should also monitor fleet service, preventive maintenance and repairs. This would ensure fleet maintenance information is recorded consistently and accurately. Management reports produced by MPMS should be reviewed to ensure data is reliable and fleet maintenance performed.

---

### Improve Timeliness of Preventive Maintenance

The department has established policies for completion of maintenance for passenger vehicles which require basic service be performed at 5,000 mile intervals and preventive maintenance at 20,000 mile intervals. We reviewed fleet maintenance to determine if maintenance is conducted according to department policy. We found maintenance is not always completed on rental fleet and leased vehicles according to department policy.

There are a number of factors affecting timely servicing and maintenance of the Motor Pool fleet. Primarily, staff are unable to adequately monitor fleet maintenance as service and preventive maintenance information is not readily available and is often incomplete and inaccurate. We also found Motor Pool staff do not follow the department's established criteria for servicing leased vehicles. Some of the problems related to leased Motor Pool vehicles result from unclear policy regarding who is responsible for providing and monitoring service to leased vehicles.

The department can enhance Motor Pool operations by improving monitoring of maintenance activity, and communicating policy regarding maintenance of leased Motor Pool cars.

---

### Need for Policies and Procedures

Motor Pool operations are managed in an informal manner. We found limited documented guidance available to staff. Staff members also expressed frustration with the informal means of receiving policy changes. Lack of formal policies and procedures has caused inconsistencies in operations and has impeded efficiency and effectiveness of Motor Pool staff. Many of the identified inconsistencies could be addressed by developing specific policies and procedures. The department should develop and distribute policies and procedures to Motor Pool management and staff.



# Chapter I - Introduction

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## Introduction

The Legislative Audit Committee requested a performance audit of the Montana Department of Transportation's (MDT) highway maintenance and equipment operations. This report addresses our audit of the Equipment Program, including the state Motor Pool.

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## Audit Objectives

The objectives of the audit were to:

1. Determine whether the department's equipment fleet is meeting user needs.
2. Determine the effectiveness and efficiency of equipment acquisition and maintenance.
3. Review shop facilities and repair equipment to determine safety and usefulness.
4. Review and evaluate management controls related to program operations.
5. Review and evaluate Motor Pool operations.
6. Review controls over significant computer management systems to ensure system security, and data accuracy and usefulness.
7. Review compliance with applicable statutes and rules.

---

## Audit Scope and Methodology

During preliminary audit work, we gathered information on MDT highway maintenance and equipment activities. We interviewed department staff and reviewed management information. We visited two district offices, two division offices, six shops, and numerous maintenance section houses. Based on preliminary work, we determined the audit should focus on equipment and Motor Pool operations. The department's highway maintenance operations were not reviewed as part of this audit because the department was in the midst of reorganizing and reviewing state-wide field maintenance operations.

## Chapter I - Introduction

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The audit was conducted in accordance with governmental auditing standards for performance audits. Our audit of equipment operations included an examination of controls over the department's computerized Equipment Management System and an evaluation of the accuracy and usefulness of information generated by the system. We examined program management controls such as funding, organization, goals and objectives, policies and procedures, communication, and staff levels. We also reviewed internal controls over staff activities such as supervision, training, performance appraisals, and position descriptions. This was done to determine if management controls were in place and effective in managing the daily operations of the program. Audit scope included an evaluation of equipment selection, testing, fabrication, distribution and replacement. This involved observations of Central Shop operations and a review of equipment files in the Helena central office from July 1, 1987 through November of 1991.

The MDT conducts almost all equipment maintenance in the field. Thus, the review of equipment maintenance activities involved visits to those divisions and districts not visited during the preliminary review. This included audit work at seven field offices, nine shops and fifty-five highway maintenance section houses. We interviewed district engineers, maintenance chiefs, maintenance foremen, and shop superintendents to obtain input on equipment operations. We also interviewed shop mechanics, maintenance section supervisors, and equipment operators to determine if equipment is meeting user's needs, to identify procedures used for equipment maintenance and to obtain suggestions for improvement of operations. We selected a sample of equipment from the department's fleet and located each piece of equipment. For each sampled item we reviewed service, maintenance and repair records, and equipment condition to determine whether the fleet is properly maintained. We observed shop operations to determine what repair and service work is conducted and level of staff activity. While in the field we also assessed adequacy of shop facilities and repair equipment used to maintain the department's fleet of equipment.

The review and evaluation of Motor Pool operations was similar to that of equipment maintenance as many of the same areas

were examined using comparable methodology. It included a review of fleet maintenance and condition, the ability of the fleet to meet user's needs, and management controls. We also examined management information including the reliability of computer generated data. In addition to these areas, we examined other areas unique to the Motor Pool. We analyzed fleet use and size to determine if the vehicle fleet is appropriate for meeting user demand. We reviewed equipment rental and lease rates to ensure the existing rates appropriately recovered costs of operations. Procedures related to the leasing of vehicles were examined to determine if documentation and utilization is satisfactory. We examined reasonableness of vehicle acquisition and disposal, and the process for reservations, check-out and vehicle return. We also distributed a questionnaire to obtain input from a sample of persons using Motor Pool vehicles. This feedback was used to assess user satisfaction and compile suggestions for improvement of operations.

We contacted other states to identify how their equipment and central Motor Pool operations function. We used this information to compare against Montana's operations and identify alternative approaches and solutions. We contacted several equipment manufacturer representatives to obtain information pertinent to equipment availability and purchases.

Since there is also an airplane assigned to the equipment program, we discussed airplane use and maintenance with department personnel and reviewed applicable documentation. This was done to assess the reasonableness of use and maintenance of the airplane.

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### Compliance

We reviewed program compliance with statutes and administrative rules relating to equipment and Motor Pool operations. Generally, we found the department to be in compliance with state laws and administrative rules.

## Chapter I - Introduction

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### Performance Appraisals

We identified an issue of noncompliance related to completion of performance appraisals. We found performance appraisals for Helena based equipment and Motor Pool operations staff have not been conducted on an annual basis as required by the Administrative Rules of Montana.

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### Management Memorandums

During our audit we issued management memorandums to department officials concerning four less significant issues:

Microcomputer Controls - The department needs to establish controls over Motor Pool microcomputer applications to ensure accuracy of data. Three application controls could be improved: 1) input controls, 2) output controls, and 3) audit trail. The microcomputer is used to assess fleet use, determine optimal fleet size, and identify vehicles to be replaced. Identified concerns could significantly affect the accuracy of the information generated.

Improper Cost Allocation - The department needs to ensure program costs for staff are properly allocated in the equipment and Motor Pool programs. The dollar amount of improper cost allocation is not significant.

Preventive Maintenance Schedules - The department should clarify its policy regarding preventive maintenance schedules to ensure proper and consistent maintenance of MDT equipment. The schedules state when preventive maintenance should be completed. We found preventive maintenance schedules referring to equipment with hour-meters confusing.

Compilation of Fleet Use and Demand Information - A thorough evaluation of demand for Motor Pool vehicles includes measurement of those instances when demand for vehicles can not be met. The department should collect this data, noting dates turn downs occur, number of requests that could not be met, and type of vehicle requested.

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### Areas for Future Review

During our performance audit, we identified areas which we believe warrant future performance audit work.

Highway Maintenance - Because this program is in transition, a performance audit of the Highway Maintenance Program is not now appropriate. This program is responsible for preserving and

maintaining the state highway system and its related facilities. The department recently reviewed field maintenance operations in the state and plans to complete some reorganization. The department's Maintenance Management Information System is also undergoing modification.

The audit would focus on the condition of state maintained highways and the department's actions to identify and address maintenance needs.

Other Agency Vehicles - In addition to the MDT equipment fleet, there are approximately 3,800 vehicles (passenger, bus, truck, all-terrain vehicle, trailer, etc.) which are owned and operated by other state agencies. We found limited information pertaining to vehicle inventory and costs. A future audit could review acquisition, management, and maintenance of these vehicles.



# Chapter II - Background

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## Introduction

This chapter provides an overview of the Equipment Program of the Montana Department of Transportation (MDT) including the Motor Pool. It addresses the role and responsibilities of these programs, organization, funding, and staffing.

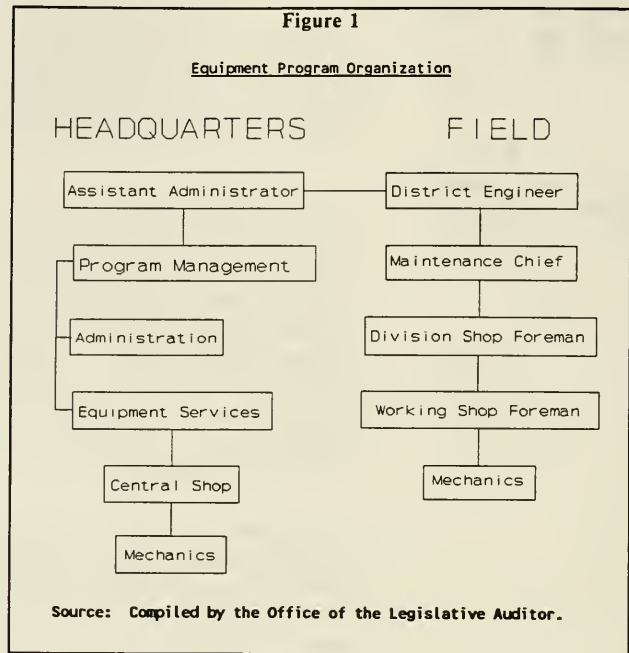
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## Department of Transportation

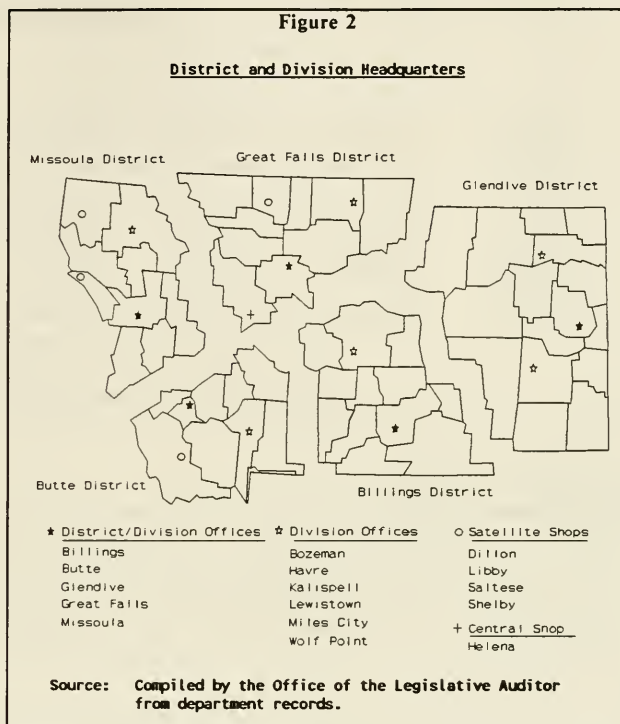
The 1991 Legislature combined the former Department of Highways and several other related transportation functions to create the new Department of Transportation effective July 1, 1991. The Department of Transportation is primarily responsible for planning, designing, constructing, maintaining, and regulating the state's highway systems. The department is organized into five divisions. The Highways Division is responsible for the Equipment Program. Reorganization of the Department of Highways did not significantly change equipment maintenance and Motor Pool operations.

The Equipment Program is administered by the division's Maintenance and Equipment Bureau. This bureau is responsible for all highway, equipment and facilities maintenance functions, and Motor Pool operations. It oversees and provides administrative support services to field equipment operations. Field offices are responsible for daily maintenance of highway equipment. The following figure shows headquarters and field organization:

## Chapter II - Background



Field operations are located in five geographical districts, which are subdivided into divisions. There are 11 divisions in the state, each with its own office and equipment shop(s). Each division has numerous section houses within it. Each section house, which is part of the Highway Maintenance Program, is responsible for its own assigned equipment. The following figure gives a breakdown of districts, including district and division headquarters locations.



There are 16 equipment maintenance shops statewide: 1 Central Shop, 11 field, and 4 field satellite shops. The Central Shop in Helena is responsible for receiving, surplus, rebuilding, and fabricating all equipment.

### Equipment Program

The goal of the Equipment Program is to provide economical equipment which is multi-functional, safe, and effectively accomplishes required tasks. The Maintenance and Equipment Bureau is responsible for managing the department's equipment fleet. The bureau acquires and distributes new equipment and surpluses old equipment. Equipment is rented to other programs within the department. The bureau also develops and monitors budgets, and manages the Motor Pool. Central Shop and field

## Chapter II - Background

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personnel are responsible for maintenance and repair of equipment.

Decisions for equipment purchases and allocations are made by central and field management. Central management reviews field equipment requests and data from the Equipment Management System to help make decisions. A committee of field and headquarters personnel provide some input into the process.

As of December 1991, there were 4,099 pieces of equipment in the department's fleet, not including the Motor Pool. Of these, 1,418 are cars, pickups, suburbans, snow plow trucks (everything with an odometer), and 2,681 are motor graders, loaders, plow blades, and tar pots (everything else). Appendix A gives a more detailed breakdown of the department's fleet.

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### Funding/Staffing

Income is derived through rental charges. Eighty-five percent of equipment is rented to highway maintenance and the remainder is rented to the Construction Program, the Motor Carrier Services Division, and other department functions. Rental rates are established using fixed and variable equipment costs.

Equipment Program revenues, expenditures, and working capital for fiscal years 1987-88 through 1990-91 are illustrated in the following table. The Equipment Program is funded entirely through an Internal Service Fund. Some federal funds "flow through" the program due to federal funding of construction projects.

Table 1

Equipment Program Funding

| <u>Category</u>         | <u>Actual<br/>FY 1987-88</u> | <u>Actual<br/>FY 1988-89</u> | <u>Actual<br/>FY 1989-90</u> | <u>Actual<br/>FY 1990-91</u> |
|-------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Revenues & Transfers In | <u>\$12,292,946</u>          | <u>\$12,342,710</u>          | <u>\$11,802,107</u>          | <u>\$13,178,894</u>          |
| Expenditures:           |                              |                              |                              |                              |
| Personal Services       | \$ 3,410,870                 | \$ 3,422,528                 | \$ 3,549,328                 | \$ 3,764,949                 |
| Operating Expenses      | 3,904,607                    | 4,359,085                    | 4,652,969                    | 4,875,919                    |
| Equipment               | <u>5,447,208</u>             | <u>4,977,583</u>             | <u>4,902,921</u>             | <u>4,928,592</u>             |
| Total                   | <u>\$12,762,685</u>          | <u>\$12,759,196</u>          | <u>\$13,105,218</u>          | <u>\$13,569,460</u>          |
| Working Capital *       | <u>\$ 2,281,214</u>          | <u>\$ 1,867,681</u>          | <u>\$ 553,692</u>            | <u>\$ 153,508</u>            |

\* Current assets less current liabilities

Source: Compiled by the Office of the Legislative Auditor from SBAS records.

The Equipment Program is authorized 116.8 Full-Time Equivalent (FTE) positions. Staffing includes 17.8 FTE located at the Helena headquarters. Of these, 6 FTE are assigned to the main office, 10.8 FTE are assigned to the Central Shop, and 1 FTE is a pilot. The pilot takes aerial photos and provides air travel to highway personnel. The remaining 99 FTE are field equipment maintenance positions.

### Motor Pool Program

The Maintenance and Equipment Bureau is responsible for administration of the Motor Pool. The Motor Pool operates the state's fleet of rental and lease vehicles available to all state officials and employees. There are approximately 210 vehicles in the Motor Pool fleet. The vehicles are parked at a centralized location in the capitol complex.

Total miles logged on Motor Pool vehicles and the average fleet size over the last five fiscal years is illustrated in Table 2.

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Table 2

Total Miles Logged & Average Fleet Size

| <u>Fiscal Year</u> | <u>Miles Logged</u> | <u>Average Fleet Size</u> |
|--------------------|---------------------|---------------------------|
| 1987-88            | 3,634,386           | 146                       |
| 1988-89            | 3,467,900           | 164                       |
| 1989-90            | 3,705,381           | 188                       |
| 1990-91            | 3,631,908           | 199                       |
| 1991-92            | 4,013,838*          | 213*                      |

\*projected by department

Source: Compiled by the Office of the Legislative Auditor from department records.

### Funding/Staffing

The Motor Pool Program is funded entirely through an Internal Service Fund. Costs of operating the Motor Pool are recovered primarily through rental fees charged to user agencies based on the average operating costs per mile for each type of vehicle. Revenue is also generated by leasing vehicles to agencies. Motor Pool revenues, expenditures, and working capital for the past four fiscal years are illustrated in the following table.

Table 3

Motor Pool Program Funding

| <u>Category</u>    | <u>Actual<br/>FY 1987-88</u> | <u>Actual<br/>FY 1988-89</u> | <u>Actual<br/>FY 1989-90</u> | <u>Actual<br/>FY 1990-91</u> |
|--------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Revenues           | <u>\$773,833</u>             | <u>\$788,592</u>             | <u>\$899,722</u>             | <u>\$1,071,302</u>           |
| Expenditures:      |                              |                              |                              |                              |
| Personal Services  | \$118,943                    | \$123,724                    | \$ 128,900                   | \$139,637                    |
| Operating Expenses | 229,595                      | 210,412                      | 221,923                      | 238,037                      |
| Equipment          | 408,375                      | 567,859                      | 666,403                      | 559,746                      |
| Total              | <u>\$756,913</u>             | <u>\$901,995</u>             | <u>\$1,017,226</u>           | <u>\$937,420</u>             |
| Working Capital*   | <u>\$351,683</u>             | <u>\$236,321</u>             | <u>\$115,603</u>             | <u>\$251,713</u>             |

\*Current assets less current liabilities

Source: Compiled by the Office of the Legislative Auditor from SBAS records.

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The Motor Pool is authorized five FTE. These positions include a manager, three service/combination staff, and a mechanic. The manager and the three service/combination staff are located at the Motor Pool facility. The mechanic is stationed at the Central Shop in Helena. Day-to-day operations of the Motor Pool are the responsibility of the manager. Vehicle fueling and general servicing are performed by service/combination staff, and the mechanic is responsible for fleet preventive maintenance.



# Chapter III - Equipment Program

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## Introduction

The Equipment Program of the Montana Department of Transportation (MDT) acquires and maintains all MDT equipment. The acquisition process includes: needs assessment, identification of equipment to be replaced, consideration of funding, development of equipment specifications, testing, and field distribution. Once acquired and distributed, equipment becomes the responsibility of MDT field personnel. Each field division is responsible for maintenance and repair of all equipment assigned to it. Equipment is utilized until its useful life is depleted. At this point, equipment is either sold at auction or disassembled and used for replacement parts.

This chapter provides an overview of the Equipment Program. We identified areas where operations appear to be functioning as intended. We also found areas where improvements could be made. The following sections summarize our observations, including recommendations for improvement.

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## Areas Operating As Intended

We reviewed various aspects of the Equipment Program. We found a number of areas operate as intended and provide the division assurance of proper program operation.

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## Management Controls

Our review of management controls indicates program organization provides reasonable levels of supervision and an appropriate chain of command. Program administration is centralized in Helena. Field operations are decentralized and are directed by District Engineers who report to the assistant administrator of the Highways Division. There are various levels of supervision within the field organization. Program funding allows the department to obtain equipment required for maintenance of Montana's highways. Overall, equipment expenditures have remained constant over the past four fiscal years. In addition, funds provide for staff and parts necessary to maintain this equipment. We reviewed job descriptions and obtained input from program personnel. Based on our review, job descriptions appear to appropriately reflect staff responsibilities for the

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Equipment Program. In addition, long-term staffing levels are sufficient for completion of program field operations.

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### **Equipment Acquisition and Replacement**

We compared division equipment levels and reviewed procedures for distributing equipment to determine fairness. Our review and comparison indicate overall, equipment distribution is equitable statewide. Our audit included a review of the effectiveness of the equipment fabrication process. Although we identified a concern with idle new equipment noted on page 33, the current fabrication process appears to be timely and effective once equipment is physically in the Central Shop and work begins.

Equipment replacement was also reviewed during our audit. The computer program used to identify equipment requiring replacement uses logical steps to identify equipment which may have reached its useful life. The equipment surplus/disposal process was reviewed to determine if equipment is properly surplused after use. Department procedures for equipment surplus/disposal allow for maximum return on equipment no longer needed for maintenance operations.

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### **Equipment Maintenance Operations**

Mechanic performance is based on completion of equipment maintenance and repair work. We reviewed shop files and interviewed personnel to determine timeliness of equipment service and repair. Our review of shop operations indicates mechanics are productive and complete repairs in a timely manner.

From our observations, equipment repair and service provides minimal interruption of highway maintenance activities. We also evaluated repair and service backlog and equipment downtime. Shop maintenance and repair backlogs are minimal, and most equipment does not experience excessive downtime. We reviewed use of equipment warranties and found staff use warranties for applicable situations. Shop parts and supplies were examined as part of the audit. Our observations show inventories at each of the shops visited allow for proper maintenance of equipment and are not excessive.

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We evaluated repair versus replacement policy to determine if decisions are economical. Equipment appears to reach its useful life prior to being disposed of or surplus. Shop facilities were evaluated to determine safety and layout effectiveness. In general, facilities provide shop personnel a safe work environment to repair and service equipment. While reviewing shop facilities, we evaluated types and amounts of repair equipment. For those shops reviewed, repair equipment allows for proper maintenance of the department's fleet.

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### **Department Aircraft**

The Equipment Program is responsible for the department's airplane. We reviewed the uses of and procedures for maintaining the airplane. The airplane's main use is aerial photography, but it is also used for other matters including transportation of department personnel. During the 1991 Special Legislative Session, the Legislature prohibited use of department aircraft to fly commissioners to and from meetings if a cheaper mode of travel exists. The department's airplane maintenance program, which is approved by the Federal Aviation Administration (FAA), appropriately maintains mechanical operation.

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### **Computer Controls**

We limited our review of the Equipment Program computer system to security controls. The department has established controls to ensure data security. Our review of the computer system was limited due to a separate electronic data processing (EDP) audit, report number 89DP-37. The EDP audit reviewed internal controls relating to the department's computer-based systems.

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### **Program Operations Which Could Be Improved**

Overall, equipment is adequate to meet maintenance needs and is in good condition. We did note several areas where operations could be improved. The following sections summarize our findings and recommendations.

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### Equipment Management System

According to the Federal Highway Administration, the primary objective of equipment management should be to obtain maximum productivity from equipment and equipment supporting resources. An effective equipment management information system enables management to maintain a fleet which meets user demands. A management information system should relate specifically to equipment objectives, avoid collection of unnecessary data, and provide reports structured for use by individuals responsible for decision making.

The Equipment Program has a computerized Equipment Management System (EMS). EMS monitors fleet operations, maintenance, shop performance and production, and integrated financial information. The EMS was mandated by the Legislature in 1983 and was designed to provide fleet information to all levels of equipment managers.

The EMS was developed under the following objectives outlined in the EMS manual:

1. Preserving the investment made in the fleet through timely servicing, preventive maintenance, and repairs.
2. Maintaining equipment rental rates and financial information.
3. Identifying fleet repairs and causes so as to reduce downtime.
4. Maintaining an equipment replacement component which identifies equipment that has reached economic life.
5. Ensuring efficient and economical use of the fleet and manpower.
6. Purchasing vehicles and equipment that are multi-functional and support maintenance, engineering, construction, and other user requirements."

The EMS depends heavily on computer processed data. Information needs are categorized into three areas: equipment performance, shop performance, and administrative records. Reports

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were designed to be used by various levels of equipment managers from top management through highway maintenance supervisors.

We reviewed the Equipment Management System including data input and processing, and report distribution and use. We identified areas where the EMS could be improved. The following sections discuss these issues.

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### Data Input

We examined reliability of data input to the EMS. We reviewed procedures used by field personnel for completing the Equipment Operator Usage Report form (EMS-1). We found equipment usage information is entered inconsistently. Equipment usage should be based on actual hour-meter hours or actual mileage to provide the most accurate information. However, some staff enter actual hour-meter hours, others enter usage hours, while others enter assigned hours. Hour-meters record actual engine operating hours, usage hours reflect amount of time equipment is used on specific projects, and assigned hours relate to the total amount of time equipment is assigned to a particular highway crew (maintenance, construction, Motor Carrier Services Division). For example, a front-end loader is physically located at a gravel pile for eight hours. The crew uses it for four hours to load gravel. Yet, since crews load gravel and then shut off the loader while gravel is hauled to a work site, only two hours are recorded on the hour-meter. Thus, assigned hours equal eight, usage hours is four, and the hour-meter indicates two.

The EMS-1 form is not designed to provide space for recording actual mileage or hour-meter readings for preventive maintenance completion. Instead, the department estimates Level I preventive maintenance completion using ending odometer or hour-meter readings for the two week reporting period. This limits preventive maintenance information that could be used to better monitor timeliness of equipment maintenance.

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### Data Processing

We tested the EMS processing function, pertaining to equipment repair data to determine the integrity of system information, for calendar year 1991. We found equipment repair information in the EMS was inaccurate due to duplication of one month's data. It appears the master file was updated twice during the same month which would cause data duplication. We found there are no formal procedures regarding the EMS functions for program operators to follow. This concern was also identified during the EDP audit, report number 89DP-37. EMS processing appears to work correctly but incorrect procedures were performed causing the EMS data duplication. The duplication of information cannot be corrected without re-entering all equipment repair data.

Other data processing weaknesses exist. Improper data correction procedures were identified during the EDP audit. Equipment usage data is subject to the EMS edits prior to updating the master file. EDP auditors found data entry personnel make unapproved changes to the EMS data to by-pass computer edit errors. As a result, the integrity of the EMS master file data is questionable.

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### Data Reporting

In order to make appropriate decisions and preserve the department's investment in the fleet, management must have accurate and timely information. EMS reports should focus management attention on information needed for program operating decisions. During the audit we found the EMS is not meeting the needs of central and field management. We also found EMS report information is not compared to input data to verify accuracy.

Field management does not find the EMS to be an effective management tool. They indicated information produced by the EMS is often inaccurate and untimely. EMS data is input by field personnel bi-weekly, data processing takes approximately one week, and report distribution time frames vary. Thus, delivery of EMS reports to the field takes three to four weeks minimum, which is not timely for some of the system's intended purposes.

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There are eight management information reports distributed to the various levels of field management:

1. Division Summary by Class (EMS-02)
2. Equipment Call Back (EMS-05)
3. Shop Production (EMS-06)
4. Shop Performance (EMS-07)
5. Preventive Maintenance Program Summary (EMS-08A)
6. Section Equipment Summary (EMS-10)
7. High Downtime Summary (EMS-16)
8. Area Active Equipment Inventory (EMS-19A)

Of these eight reports, personnel stated the preventive maintenance and equipment summary reports are inaccurate and untimely. Field personnel indicate other reports including EMS-02, EMS-05, EMS-06, and EMS-07 are used sparingly. Some field personnel said management information is not properly designed for use in the field; thus, reports are not fully utilized. In addition, some field staff said they do not receive the EMS reports because of distribution problems. While reviewing field personnel training records, we noted no recent training regarding use of the EMS.

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### EMS Usefulness is Questionable

Field staff are generally frustrated with the EMS and some equipment shop managers have developed their own reports to monitor equipment operations. These reports duplicate the intent of management information compiled by the EMS.

Within the next two years, management plans to transfer the Equipment Management System from the state's mainframe computer to the department's minicomputer and replace paper reports with on-screen viewing. This may improve the timeliness of information, but will not solve other problems. Section houses will not have access to the new minicomputer; thus, there will still be a need for some paper reports.

We believe department management should review the Equipment Management System in further detail to identify management information which is not meeting the needs of both central and field management. Good management information will allow management to monitor equipment service, repair, and preventive maintenance. This will ensure preservation of the

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investment made in the fleet. In addition, it will help management determine whether the fleet is used efficiently and economically. An adequate equipment management information system will improve management control and service to equipment users.

The effectiveness of the EMS depends on how individual managers throughout the Equipment Program perceive and use the system. A vital aspect of any management information system is the education and direction of managers and users to ensure system capabilities are understood and report information is used effectively.

### **Recommendation #1**

**We recommend the department:**

- A. Review and revise the Equipment Management System to ensure it meets established objectives and provides useful, accurate, and timely management information.**
- B. Establish appropriate controls over data input, processing, and output.**
- C. Provide appropriate training to ensure staff understand how to use the Equipment Management System.**

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### **Equipment Selection**

The MDT's current equipment selection process operates on a two-year cycle. The process consists of identifying needed equipment and equipment to be replaced, and developing bid specifications for purchasing this equipment. The maintenance chiefs, maintenance foremen, and shop superintendents of each division identify equipment needs for the upcoming biennium. Priorities are established, then communicated to headquarters through equipment request lists. Once received, the Management Systems Section supervisor compiles field requests. According to department policy, the Equipment Planning and Evaluation Committee (EPEC) is to convene to review and

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evaluate requests, prioritize needs to match funding, and determine equipment allocations. EPEC is a committee of headquarters and field representatives formed to assist department management in the equipment selection process. Department management has final approval authority for equipment selection.

Headquarters personnel develop specifications for equipment prior to actual purchases. Highway maintenance needs sometimes necessitate equipment modification and/or development of new concepts and designs. New types of equipment also become available. Once equipment specifications are finalized, Department of Administration personnel assume responsibility for the purchasing process including soliciting and awarding bids.

During our audit, we reviewed the MDT equipment selection process. We identified several concerns with this process which appear to be related to lack of input from field personnel, a breakdown of communication from headquarters to the field, and equipment which does not meet user needs. These areas are discussed in the following section.

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### **Equipment Not Meeting Needs in Field**

A primary goal of the Equipment Program's acquisition process is to ensure department and equipment users' needs are reasonably met. As noted previously, overall, equipment is adequate to meet needs. However, we identified certain instances where the department does not always provide equipment which meets the needs of users. The department has also purchased equipment which is not fully used and in some instances is not used at all.

Over the past five years, most half-ton pickup trucks assigned to highway maintenance crews were replaced with one-ton utility trucks. The decision was based on input from upper level field and central management to provide vehicles which were supposedly more versatile.

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**Picture 1**

**One-ton Utility Trucks Which Replace Half-ton Pickups**

**MDT Central Yard**



Some highway maintenance staff like the one-ton utility trucks and find them useful. Numerous other highway maintenance staff stated they could get better use from a pickup truck rather than a utility truck. A current primary use of utility trucks is to drive all roads within a section to check highway conditions. Poor fuel economy (averaging 6 miles per gallon) is a concern of field personnel. The bigger single-axle snow plow trucks get better mileage (averaging 9 miles per gallon). As a result, utility trucks are not very economical for conducting road inspections.

If the department continues to use utility trucks, these trucks need to be more versatile in order to be effectively used by field staff. Both field management and staff indicated the hydraulic system on these trucks should be expanded to accommodate use of other attachable maintenance equipment such as liquid asphalt distributors (tar pots), air compressors, power sweepers, and crack sealers. This would allow field staff to conduct more

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highway maintenance activities with utility trucks such as sealing cracks in pavement and sweeping debris. These activities currently require use of the larger single-axle plow trucks. In addition, some maintenance crews have very limited use or no use for plows provided with utility trucks. The primary use for these plows is pushing rocks off highways. Field staff said the plows are too small for plowing snow.

Field personnel also expressed concerns with other equipment purchased by the department. Highway maintenance crews are not able to complete all maintenance tasks as required when using smaller size rollers (3-5 ton ) purchased by the department. The size of the smaller rollers prevent personnel from completing some tasks efficiently and safely. Rollers are used to compact material for filling holes and low areas in road surface, roadway edge restoration, and to compress gravel. Larger size rollers (6-8 ton) could be used to conduct additional maintenance such as chip seal and overlay of road mix to pavement surface. Because of the limited number of large rollers, crews are using small rollers on projects for which they were not intended.

Recently purchased asphalt recycler/mixers do not have the capacity necessary to accomplish routine highway maintenance projects. Asphalt recyclers produce hot road mix material. The mix is used to fill potholes or level distorted road surfaces. According to field personnel, the recyclers are slow and cannot produce mix fast enough for maintenance requirements. There were also problems with the burner system used to heat mix. As a result, crews do not always use the recycler and rely on cold road mix for some highway maintenance projects. Cold road mix cannot be compacted properly and, therefore, serviceable life of the maintenance work is shortened.

We noted several instances where the department plans on providing equipment which was not requested by field management or staff. A comparison of the field's 1992-93 biennium equipment request lists with the department's proposed/scheduled purchases revealed more proposed snow plow truck (three types/classes) purchases than requested for several divisions.

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Because of problems encountered in the field, the department has recently addressed some of the issues noted above. The department is now purchasing one-ton utility trucks with diesel engines to help improve fuel mileage. Field management must now request a plow for each one-ton utility truck in order to receive one. Department management appears to have obtained and considered some input from equipment users, however, they still are not addressing user needs.

### Field Input and Communication of Decisions

There are several reasons for some equipment not meeting needs: 1) field input is not properly considered, 2) field personnel either do not understand equipment limitations or are not aware of them, and 3) department management incorrectly identified a statewide need for one-ton utility trucks.

Although equipment operators can provide input to the equipment selection process through field management, the current process does not appear to work. In the early 1980s, the department established the Equipment Planning and Evaluation Committee (EPEC) as a result of a consultant's recommendation to increase field input in the equipment selection process. According to management, the original committee was involved in every aspect of the equipment selection process. Since then, the role of the EPEC has diminished. The committee meets only every other year and has limited involvement in equipment selection. Currently, headquarters makes all final selection decisions. Management indicated it has encouraged EPEC members to become more involved in the equipment selection process. However, EPEC members indicate they are allowed only limited responsibility and authority in acquiring MDT equipment.

The department holds an annual training session for each division in the state which management believes provides field staff an opportunity to give input. However, field input pertaining to equipment selection is not the main focus of this training session. This session appears to be the only formal meeting where equipment operators are given a chance for direct input.

Field personnel lack an adequate understanding of MDT's selection process and decisions. We received comments from field

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personnel which indicated a general lack of knowledge of department selection decisions. For example, questions were asked by field management and personnel why the department developed a new hydraulic system for utility and snow plow trucks. Field personnel at all levels also did not understand the reasons for adopting the one-ton utility trucks as a standard piece of equipment. It appears information regarding equipment selection and standardization is not disseminated through various levels in the department's organizational structure. For example, headquarters should explain reasons to field staff why the department incorporated one-ton utility trucks into the fleet.

Department management indicates equipment will not always meet the needs of each individual user. This is because the department strives to standardize equipment statewide. In addition, management says it has communicated reasons for equipment selection decisions for the specific examples mentioned above. However, we did not obtain this impression from field staff. Management did indicate a recent lack of communication with field personnel due to management's involvement with reorganization of the department for the past 18 months. The department implemented a new maintenance review section which Equipment Program management will try to use to obtain field input.

### Summary

As a result of inadequately soliciting input from field staff, the department has purchased equipment which is not effectively used by highway maintenance crews. Improper equipment makes it difficult for field crews to complete required tasks. This decreases the effectiveness of highway maintenance operations and reduces crew productivity. The failure to communicate equipment selection decisions back to the field has resulted in inappropriate use of equipment.

We believe department management should strengthen the equipment selection process by obtaining direct input from field staff. In order to accomplish this, management should consider these options: 1) provide for increased operator input during equipment needs development, and/or 2) use the EPEC as it was intended to be used. Implementation of one or both of these options will help improve the effectiveness of equipment

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purchases and ensure equipment adequately meets the needs of users. Highway maintenance crews and other MDT equipment users have firsthand knowledge of how equipment must perform to complete required tasks. Their input should be considered by department management when making decisions regarding equipment selection. Management should also increase communication to ensure both field management and staff are informed of equipment selection decisions.

### Recommendation #2

We recommend the department:

- A. Increase direct input from MDT field staff during the equipment selection process.
- B. Explain equipment selection decisions directly to field staff.

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### Equipment Testing Process

Equipment testing is essential to ensure equipment will meet the department's needs. During our work we contacted General Motors to see what a manufacturer does regarding equipment testing. General Motors has established procedures and criteria for equipment testing. Test results are also documented so adjustments can be made to increase product effectiveness.

Personnel within the Equipment Program conduct two types of equipment testing: 1) initial testing, and 2) field testing. Any necessary preparation and initial testing of new equipment is done by Central Shop personnel. Initial testing covers basic operation of each piece of equipment including the engine, transmission, controls, and specialized components. All equipment goes through initial (Central Shop) testing. Equipment/component prototypes require additional testing. This type of equipment is transferred to the field and tested by highway maintenance personnel. If field testing is successful, prototypes are introduced into the department's fleet as standard equipment.

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Although most equipment appears to undergo some testing prior to introduction into the department's fleet, all equipment testing is done informally. We found no documented equipment testing procedures to guide department personnel through the testing process. Criteria for test results has also not been formulated. In addition, documented test results are not required or completed. We could not verify results of testing of any MDT equipment.

We found the majority of field testing is completed in areas surrounding Helena so management can easily monitor progress. Field personnel, located outside the Helena area, have limited involvement in the testing process. Thus, equipment is not tested under various operating conditions including differing geographical and climatic areas of the state.

The lack of formal department equipment testing policies and procedures appears to have adversely affected equipment operations. While procedures for testing some equipment appear to have been successful, other procedures were not.

For example, four years ago, department management decided to develop a new hydraulic system to improve equipment efficiency. A prototype system was developed and placed on several one-ton utility trucks which were then tested in the field. The prototype system was subsequently adapted to fit the bigger medium and heavy-duty snow plow trucks. The system was then placed on two single-axle snow plow trucks for additional field testing. The snow plow trucks had been operating in the field for about six months, during the warm weather season, when the decision was made to adopt the new hydraulic system as a standard fleet component. This system was placed on 20 one-ton utility trucks. The one-ton trucks were ready for delivery to the field when problems occurred with the two snow plow trucks fitted with the prototype system. The hydraulic system did not function properly during winter weather conditions. As a result, the new hydraulic system had to be changed, including relocating and pressurizing the hydraulic tank, and changing the size of the hydraulic line to the pump. These changes also had to be made to systems already installed on 20 one-ton utility trucks.

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During our field visits, we received complaints from field personnel regarding plows installed on one-ton utility trucks. These trucks experienced engine overheating because the plows blocked engine air flow. Some field personnel modified the plows while others stopped using the plows entirely.

Field personnel indicated recently purchased distributors (tar pots) were not properly equipped for maintenance needs. The plumbing and hoses of this equipment had to be modified before it could be used by maintenance crews. As mentioned previously, highway maintenance personnel stated recently purchased asphalt recycler/mixers do not work as intended. The burner system for heating road mix did not work properly.

As a result of concerns mentioned above, the entire Central Shop schedule was postponed and equipment delivery delayed. For example, the modification of hydraulic systems previously installed on 20 one-ton utility trucks took a month to complete. Delivery of these trucks to the field was delayed up to three months. In addition, mechanical problems with distributors transferred to the field delayed equipment utilization and maintenance activities.

Department management has failed to establish a formal testing process because they believe the present system works. According to department management, there are two reasons testing is not documented: 1) lack of manpower, and 2) field personnel are equipment operators, not report writers. Without documented test results, it is impossible for department personnel, other than those testing the equipment, to evaluate the effectiveness of equipment for completing required tasks.

The department would benefit from a formalized equipment testing process. The department should develop procedures for equipment testing including: 1) the standard number of pieces of equipment to be initially purchased for testing, 2) requirements for testing under normal working conditions in various geographical/climatic areas throughout the state, 3) requirements for more intensive testing when major equipment changes are made, 4) types of tests and procedures involved, and 5) testing of equipment for safety purposes. Formal procedures would

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provide testing guidelines for personnel and increase consistency of testing. Management should also implement procedures for documenting and reporting test results.

### Recommendation #3

We recommend the department:

- A. Develop and implement a formal equipment testing process.
- B. Formally document all equipment test results.

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### **Equipment Purchasing and Fabrication**

A major responsibility of the Equipment Program is to purchase, prepare, and issue new equipment to MDT field staff. Department management identify equipment to be purchased and develop bid specifications accordingly. Equipment preparation ranges from minimal tasks such as applying department decals to more major responsibilities such as attaching specialized bodies and other equipment to a truck chassis. During our audit, we reviewed the equipment purchasing and fabrication process.

Newly purchased equipment is delivered to the Central Shop in Helena and remains there until fabrication is complete. For most types of equipment, minimal time is required to complete preparations for field operation. Several types of equipment in the department's fleet require extensive fabrication before being placed into service. These include one-ton utility trucks and snow plow trucks. The department purchases a basic unit consisting of a cab and chassis. Central Shop personnel prepare basic units by attaching specialized components, such as hydraulic systems, plows, lights, and dump boxes, to meet highway maintenance needs.

A production line system is used for fabrication. One to six pieces of equipment of similar type are brought into the Central Shop for fabrication. Shop personnel work on these pieces of

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equipment until fabrication is complete. Equipment is then placed into service. Generally this process continues until fabrication of all equipment of a similar type is complete. The following photograph illustrates a standard phase of the equipment fabrication process.

Picture 2

Fabrication of Tandem Axle Trucks  
MDT Central Shop



We identified an area where the equipment purchasing and fabrication process could be improved. The following sections discuss these issues.

### Timing of Equipment Purchase and Delivery

During the audit, we reviewed the timeliness of the department's equipment purchasing and fabrication process. We found approximately \$5.5 million worth of equipment purchased over the past five fiscal years has been idle for between 3 and 15 months before placed into service. We reviewed the length of time that elapses between equipment receipt, fabrication, and delivery to the field. Although equipment fabrication and delivery to the field appears to be timely, we found new equipment sits idle for an unreasonable amount of time prior to shop fabrication.

Equipment which sits idle includes equipment requiring major fabrication such as utility and snow plow trucks. Other types of equipment such as motor patrols, loaders, and pickups are generally processed and distributed to the field in a timely manner. Fabrication priorities are set collectively by the Central Shop superintendent and headquarters management. From our observations, it appears priorities change according to equipment waiting to be fabricated. For example, if new equipment is delivered to the Central Shop during a major fabrication project, the new equipment gets top priority if it requires only minimal fabrication prior to being put into service.

We reviewed purchases made from fiscal year 1987-88 through 1991-92 for equipment requiring major fabrication. Seventy-five percent (177/235) of the equipment reviewed sat idle for three months or longer prior to fabrication. The following examples illustrate delays.

- Seventeen tandem-axle trucks, purchased in fiscal year 1990-91, sat idle for a period of 9 to 13.5 months prior to fabrication. Total purchase price of these trucks was approximately \$764,000.
- Assembly of 31 single-axle trucks purchased and received in July 1991 did not begin until March 1992. Fabrication of these trucks is still not complete. The trucks were purchased for approximately \$817,000. The following photographs show 25 of the trucks waiting for fabrication in September 1991 were still waiting for fabrication in April 1992.

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Picture 3

New Equipment Waiting for Fabrication

September 1991



April 1992



Although the shop is at least six months behind schedule and new equipment is sitting idle, department management continues to purchase additional equipment. As of April 17, 1992, 73 pieces of equipment requiring major fabrication had yet to be completed. Of these, 31 are trucks and 42 are suburbans. Assuming no unforeseen delays, it appears fabrication of this equipment, at the earliest, will not be complete until October 1992. Future scheduling priorities could aggravate the situation. For example, if the department follows previous purchasing procedures, delivery of newly purchased equipment will begin July 1992, and the shop production schedule will fall further behind.

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### Effects of Delays

These delays in getting equipment into operation could have significant effects in four areas: 1) additional repairs on old equipment scheduled for replacement, 2) delays in completion of maintenance work, 3) deterioration of new unused equipment, and 4) lost interest earnings.

Field personnel expressed frustration with delays in placing new equipment into service. Due to delays, field personnel must continue to use older equipment which has necessitated additional mechanical repairs and/or delayed road maintenance work. Six of fifteen single-axle snow plow trucks scheduled for replacement (in five divisions) experienced major mechanical breakdowns. As a result of breakdowns, field staff are unable to use these trucks.

Manufacturers indicate new equipment suffers damage by not being used. Damage includes tire weathering and flat spots, battery failure, dried and cracked seals, and fuel system problems which may require repair or replacement. Damage may not be immediately apparent or readily detectable, but shortens the useful life of equipment and components.

Untimely purchase of equipment results in lost interest earnings. We estimate total lost interest earnings to be \$160,802 for the past five fiscal years. Our estimate is based upon the value of equipment which sat in the Central Shop yard for periods exceeding three months. This amount could have been earned through normal fund investments if MDT had delayed equipment purchase and delivery until the Central Shop was ready to begin fabrication. Interest earned on MDT Equipment Special Revenue Fund reverts to the state's General Fund. Improved scheduling of equipment purchases and delivery may increase future General Fund interest earnings.

### Factors Contributing to Delays

As a result of inadequate planning and monitoring, newly purchased equipment sits idle for long periods of time. Equipment is generally purchased and delivered to the department before the Central Shop is ready to begin fabrication. Several factors contribute to untimely equipment purchases including: 1) the current procedure of all equipment delivered at once with delivery date generally at the dealers' discretion, 2) delays with

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Central Shop fabrication during fiscal years 1988-89 and 1989-90, 3) continued delivery of newly purchased equipment even though previously purchased equipment has yet to be fabricated, and 4) insufficient management monitoring of time frames from receipt of new equipment through delivery to the field. Various documentation is kept during the equipment purchase and fabrication process. However, it appears management does not evaluate documentation to determine if adjustments in purchasing and/or fabrication are required.

Similar groups of new equipment are usually delivered to the department all at once, with only a few days between delivery dates. We contacted manufacturers' representatives and found staggered delivery of equipment to the department could be an option. Staggered delivery would more effectively match up with the shop fabrication process. For example, shop personnel generally work on six snow plow trucks at a time for a period of three to four weeks. Yet the department takes delivery of up to 30 trucks at once. Thus, aside from the first six trucks fabricated, remaining trucks sit idle from three to sixteen weeks, assuming no delays occur. The department could require delivery of snow plow trucks in increments of six to better fit the shop's fabrication schedule.

According to department management, prior delays in equipment fabrication are the primary reason for equipment sitting idle. Although shop fabrication was untimely in the past, current fabrication appears to be timely. They also indicate prior problems with shop management and hydraulic system development delayed the Central Shop schedule. Central Shop staff levels also temporarily decreased due to worker injuries. In addition, special fabrication projects were given higher priorities than appeared reasonable. These occurrences contributed to delays in the fabrication process.

Department management does not adequately monitor the timeliness of the process from purchase of equipment through fabrication. Although Central Shop personnel recently began to monitor the time involved in the fabrication process, department management does not monitor the amount of time that elapses

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from equipment delivery dates to dates equipment is placed in service.

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### Equipment Idle Time Should Be Decreased

Management should try to decrease time between receipt of equipment and delivery to the field. Several options should be considered to accomplish this: 1) adding fabrication staff to the Central Shop, at least temporarily, 2) delaying equipment purchases and deliveries, and 3) contracting for portions of fabrication.

We believe it would be beneficial for the department to make a one-time delay in the purchase and delivery of equipment requiring fabrication. There would be some increased investment earnings for the General Fund on the unspent funds during the time purchase was delayed. In addition, future equipment deliveries should be staggered to coincide with the Central Shop's fabrication process to help prevent excessive equipment delays.

We realize a lot of variables are present in the purchasing process. However, management should evaluate each proposed purchase individually, then make appropriate decisions to obtain the best benefit for the state.

Department management recognizes the concern with equipment sitting idle and is trying to address the situation. They are identifying time-lines for equipment fabrication to help determine when equipment should be purchased. Department personnel are currently implementing an automated scheduling system to monitor the Central Shop schedule. Management is also considering a temporary increase in Central Shop staff. We believe department management should consider the options mentioned above to minimize time between receipt of equipment and delivery to the field.

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### Recommendation #4

We recommend the department:

- A. Implement changes to decrease the amount of time between receipt of new equipment and in service dates.
- B. Improve monitoring of the equipment purchase and fabrication process to ensure timely processing of new equipment.

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### **Preventive Maintenance**

Equipment Program management established an equipment preventive maintenance (PM) program to maintain the department's fleet. The objective of the program is to ensure preventive maintenance is accomplished in a consistent manner and in accordance with established PM schedules.

PM schedules were developed by management according to manufacturer recommendations and past department maintenance experience. There are two types of preventive maintenance: 1) Level I (basic oil change and service), and 2) Level II (complete inspection and major service). The PM schedules specify responsibility, required action, and service intervals for each class of vehicle within the department's fleet. Level I preventive maintenance is the responsibility of equipment operators. Highway equipment shop personnel are responsible for Level II preventive maintenance.

We identified an area where equipment preventive maintenance could be improved. The following section discusses this issue.

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### **Level I Preventive Maintenance Service**

We reviewed MDT fleet maintenance to determine if equipment is maintained according to department policy. We reviewed Level I and II preventive maintenance for a sample of 184 pieces of equipment assigned to 7 divisions in the state. The sample

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included equipment assigned to Highway Maintenance, Construction, and Motor Carrier Services (MCS) programs.

Preventive maintenance is completed to maximize the useful life of equipment. Although Level II service is completed in a timely manner, we found Level I preventive maintenance is not always completed according to MDT policy. Fourteen percent (45 of 326) of Level I PM services for maintenance equipment reviewed were completed at least 10 percent later than department recommendations. For Construction and MCS equipment, 19 percent (8 of 42) of Level I PM services were completed at least 10 percent late. Informal policy allows for a variance of plus or minus 10 percent from written preventive maintenance policy. The following table gives examples of some equipment receiving untimely Level I service.

Table 4

Untimely Level I PM Service

| <u>Equipment Type</u> | <u>Hours/Miles<br/>Between<br/>Service</u> | <u>MDT<br/>Interval<br/>Policy</u> | <u>Difference</u> |
|-----------------------|--------------------------------------------|------------------------------------|-------------------|
| Mower                 | 218*                                       | 50*                                | 168*              |
| Loader                | 189*                                       | 100*                               | 89*               |
| Roller                | 76*                                        | 50*                                | 26*               |
| One-ton Truck         | 6,349**                                    | 3,000**                            | 3,349**           |
| Half-ton Pickup       | 4,936**                                    | 3,000**                            | 1,936**           |
| Snow Plow Truck       | 5,009**                                    | 3,000**                            | 2,009**           |
| 5th-wheel Truck       | 12,496**                                   | 3,000**                            | 9,496**           |

\*Hours

\*\*Miles

Source: Compiled by the Office of the Legislative Auditor from department records.

Untimely preventive maintenance could jeopardize equipment condition and safety. Mechanical problems may go unnoticed which could increase equipment operating costs, repairs, and downtime, and decrease equipment operator productivity. Engine oil and other equipment lubricants break down after excessive use, and without proper service, equipment will experience unnecessary wear and tear.

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As mentioned previously, management reports detailing PM service information are inaccurate and untimely. Field personnel have become frustrated with the reports and do not refer to the information. Although maintenance crew supervisors informally monitor preventive maintenance, they rely primarily on equipment operators to complete Level I PM services as required.

We believe department management can improve equipment operations by enhancing monitoring of preventive maintenance to ensure field personnel comply with PM policy. There is no reliable central recording of Level I service information, therefore monitoring is difficult to accomplish. Currently, the only way of monitoring Level I PM services is to physically check records for each piece of equipment. Thus, department management must first ensure field personnel understand PM policy, then enforce compliance with established standards through supervisory review. Lastly, department management should provide field personnel with accurate and timely PM information to ease the preventive maintenance monitoring process.

### **Recommendation #5**

**We recommend the department develop procedures to monitor equipment preventive maintenance to ensure compliance with department policy.**

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### **Management Controls**

We examined management controls used by the department in administering the Equipment Program. These controls should provide for the measurement of program activities against goals and objectives and provide managers with adequate performance information. This feedback allows program management to take corrective action when deficiencies are noted. We identified several areas where management controls could be improved including goals and objectives and staff training. By addressing these areas, the overall management of the program could be improved.

### Goals and Objectives

The role of management entails directing the use of limited resources in the most effective and efficient manner to fulfill the statutory purposes of a program. An important part of this process is establishing documented, measurable goals and objectives. It is also important to periodically evaluate program performance against the established goals and objectives.

We found specific documented goals and objectives have not been established for the Equipment Program. During our review, we found management and staff receive limited formal direction specific to program intent. Although department officials do have a goal statement which supports the statutory purpose of the Equipment Program, this statement does not provide measurable short and long term goals and objectives for the program to achieve in the future. It appears department officials and management also use informal goals, but these goals are not documented nor formally reviewed.

Measurable short and long term goals and objectives could provide direction for equipment program staff, assist with meeting program intent, and provide a gauge to determine success of the program. For example, a possible goal for the equipment program would be to increase communication with field personnel. An objective to accomplish this would be to periodically survey equipment operators to determine user satisfaction with equipment.

Department officials generally manage the Equipment Program on an "as needed" basis, which primarily consists of verbal communication. Officials indicate they rely on informal communication and the experience and knowledge of staff members to ensure successful program operation.

The department should establish specific documented goals and objectives for the Equipment Program. The department should then conduct periodic reviews to determine attainment of established goals.

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### Recommendation #6

We recommend the department:

- A. Establish specific documented goals and objectives for the Equipment Program.
- B. Conduct periodic reviews to determine attainment of goals and objectives.

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### Staff Training

During interviews with field staff we found a need for additional training for field management in areas such as fleet management, supervision, and use of management information including computer skills. Equipment shop management and staff consistently indicated a need for training on the department's new hydraulic system, diesel engine repair and computerized electronics. A primary training need for shop staff is to remain informed on new systems and technology. In addition, there is a need for further equipment operator training on proper preventive maintenance techniques and operation of new types of equipment.

Field staff receive some training, but there is no consistency between the eleven divisions in the state. Training needs and scheduling are done on an informal basis. Field management believes current training is not adequate. They also stated they are not aware of a formal training program and are not routinely informed of available training.

A training needs analysis conducted during 1991 by a consulting firm employed by the department identified similar concerns. Results of a survey of headquarters and field personnel conducted by the consultant indicate equipment operations, preventive maintenance, and repairs are three of the top four training priorities. Among other things, the consultant recommended the department develop a comprehensive training program to address identified training needs. We agree with that portion of the

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consultant's findings. Department management plans to begin implementation of the consultant's recommendations in July 1992.

#### **Recommendation #7**

**We recommend the department develop a comprehensive training program.**



# Chapter IV - Motor Pool Program

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## Introduction

During the audit we examined the operations of the department's Motor Pool. The Motor Pool Program is responsible for the operation and maintenance of a fleet of rental and lease vehicles which is available to state officials and employees. This chapter provides an overview of the Motor Pool Program. It includes a synopsis of areas where operations are functioning as intended and also discusses areas where improvements to operations could be made.

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## Areas Operating as Intended

During the audit, we reviewed various aspects of the Motor Pool Program. We found a number of areas operate as intended and provide the division assurance of proper program operation. The following sections outline areas where testing identified effective controls and operations.

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## Some Management Controls Established

Program management controls examined included budgeting and organization. We found budgeting for the Motor Pool Program sufficiently provided for operations. Program organization was reasonable for conducting those responsibilities and functions which are part of the Motor Pool Program. We also found management controls related to program staffing were in place and effectively used. Supervisory structure for Motor Pool operations was reasonable. In addition, staff position descriptions provided accurate information. Lastly, appropriate training was provided to all levels of Motor Pool staff.

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## Vehicle Purchasing, Replacement, and Distribution

We examined the process and procedures used to purchase vehicles for the Motor Pool fleet and identify vehicles which should be replaced. We found this process is functioning as intended. Vehicles are purchased centrally, through the Department of Administration, with Motor Pool Program management developing bid specifications. The Motor Pool Program also has procedures in place for determining when a vehicle should be replaced. We found the program was adhering to these procedures. We also reviewed procedures used by Motor Pool staff to reserve and assign vehicles, and ensure vehicles are

## **Chapter IV - Motor Pool Program**

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returned to the Motor Pool. We found the procedures used by Motor Pool staff to perform these functions were sufficient to maintain control of vehicle distribution.

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### **Fleet Condition**

We examined the condition of the Motor Pool fleet. We found fluid levels are appropriately maintained and overall vehicle condition was good. Lastly, we reviewed the system used for addressing user suggestions and complaints and found it to be an appropriate means for considering the needs of those persons using the fleet.

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### **Computer Controls**

The Motor Pool Program uses a microcomputer to assess fleet use and determine vehicles to be replaced. During our audit, we examined general and application controls over this microcomputer and tested reliability of associated data that is generated. We found controls were generally in place which ensured the integrity of data maintained on this microcomputer. In addition, our office conducted an EDP audit (89DP-37) of general, input and output controls over the Motor Pool Management Information System (MPMS). The audit found these controls were adequate to ensure the integrity of data maintained on MPMS.

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### **Motor Pool Meeting Needs**

We also found the Motor Pool fleet is meeting the needs of its users. We distributed a questionnaire to a sample of state employees who have used Motor Pool vehicles. We found users are satisfied with the services and vehicles provided.

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### **Program Operations Which Could Be Improved**

We did identify several aspects of the management and operation of the Motor Pool which could be improved. These areas include: Motor Pool fleet size, fleet rental rates, vehicle leasing program, management information, fleet maintenance, and operational policies and procedures. Each of these areas were also identified as needing improvement in a prior performance audit of the state Motor Pool which was conducted by our office in 1982 (#81-17M). The following sections summarize our findings and recommendations.

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### Motor Pool Fleet Size

During fiscal year 1991-92, the department's Motor Pool maintained an average of 213 rental and lease vehicles. The fleet is composed of five different classes (types) of vehicles: sub-compact, mid-size, pick-up truck, four-wheel drive (4x4) utility, and vans. As of April 1992, 25 percent of these vehicles were leased to various agencies on either a short or long-term basis. Leased vehicles include some older, higher mileage vehicles which are used for routine short distance trips in the Helena area. The following illustration depicts fleet composition as of April 1, 1992.

| Table 5                                                                            |               |             |              |
|------------------------------------------------------------------------------------|---------------|-------------|--------------|
| Motor Pool Fleet<br>As of April 1, 1992                                            |               |             |              |
| <u>Vehicle Type</u>                                                                | <u>Leased</u> | <u>Pool</u> | <u>Total</u> |
| Sub-compact                                                                        | 13            | 14          | 27           |
| Mid-size                                                                           | 28            | 118         | 146          |
| Pick-up Truck                                                                      | 6             | 10          | 16           |
| 4x4 Utility                                                                        | 1             | 11          | 12           |
| Van                                                                                | <u>6</u>      | <u>18</u>   | <u>24</u>    |
| Total                                                                              | <u>54</u>     | <u>171</u>  | <u>225</u>   |
| Source: Compiled by the Office of the Legislative Auditor from department records. |               |             |              |

An essential aspect of providing this fleet is determining the appropriate number and types of vehicles required to meet the needs of those people using them. The department compiles usage information for the Motor Pool fleet based upon a daily tally of vehicles used and not used. The data is used to establish an appropriate fleet size. We found the process used to gather base usage data (number of vehicles used) is reasonable and provides accurate information.

The primary purpose of pooling vehicles is to achieve high utilization of vehicles while maintaining a relatively minimum number of vehicles. Operating the correct number of vehicles is one of the primary ways the Motor Pool can provide an effective

## Chapter IV - Motor Pool Program

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and cost efficient service, charge reasonable rental rates and ensure high utilization.

We identified areas where improvements could be made in the methodology used to determine fleet size. In addition, we believe the current fleet is not at an appropriate size. These issues are discussed in the following sections.

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### Optimal Fleet Size

Motor Pool staff determine monthly and annual average number of vehicles used, and then establish an optimal (target) fleet size which is equal to the annual average vehicles used plus one standard deviation. This is to allow them to provide enough vehicles to meet more than average demand and less than peak demand. Based on the department's method, optimal fleet size should meet 84 percent of demand.

During the audit, we reviewed the size of the Motor Pool fleet to determine if the department is operating the optimal number of vehicles. We incorporated more conservative utilization criteria in our analysis which would provide a fleet to meet 90 percent of user requests for vehicles. Our review revealed fleet size for fiscal years 1989-90, 1990-91, and 1991-92 has been larger than needed to meet 90 percent of demand for Motor Pool vehicles. In addition, planned fleet size for the upcoming fiscal year is greater than optimal size. The following table compares optimal and actual fleet size and illustrates the number of excess vehicles in the fleet.

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Table 6

Optimal vs. Average Motor Pool Fleet Size

|                    | Fiscal Years   |                |                |                |
|--------------------|----------------|----------------|----------------|----------------|
|                    | <u>1989-90</u> | <u>1990-91</u> | <u>1991-92</u> | <u>1992-93</u> |
| Average Fleet Size | 188            | 199            | 213            | 213            |
| Optimal Fleet Size | 155            | 163            | 173            | 183*           |
| Excess Vehicles    | 33             | 36             | 40             | 30             |

\* Projected figures satisfy 90 percent of demand and reflect 5.5 percent increase in usage

Source: Compiled by the Office of the Legislative Auditor from department records.

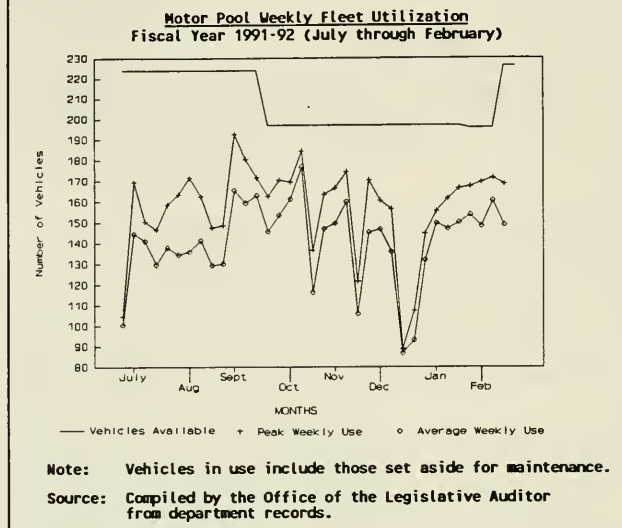
We then compared proposed optimal fleet size (as determined by our analysis) to daily usage of Motor Pool vehicles to determine the number of days which optimal fleet size would not have met demand. For the period of July 1991 through February 1992, proposed optimal fleet size was 173 vehicles. During this time period, MDT would have been able to meet 94.4 percent of all requests for vehicles. Demand would have exceeded 173 vehicles on only 9 of 160 days (5.6 percent).

A system designed to meet less than 100 percent of demand requires some state employees occasionally use alternative modes of transportation. Employees can: 1) use other types of motor pool vehicles, 2) use commercial rental cars, or 3) use personal vehicle.

Because the process for setting optimal fleet size is designed to meet less than 100 percent of demand, there should be instances when not all requests for Motor Pool vehicles will be met. We reviewed vehicle use to determine the number of days when fleet size was inadequate to meet demand. For fiscal year 1991-92 (through February 1992), the maximum number of vehicles used was 193 yet actual fleet size exceeded demand during all eight months. At no time was the entire fleet used. The following figure illustrates Motor Pool fleet utilization including the peak (maximum) number of vehicles used each week and the average number of vehicles used each week, and compares this to the number of vehicles available for fiscal year 1991-92.

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Figure 3



Our review also revealed the entire fleet was used on only two days during fiscal year 1990-91 and on only one day during fiscal year 1989-90. Department staff believe there are more instances than usage data indicates when fleet size is not adequate to meet demand. They state there are many occasions throughout the year when they can not meet all requests for vehicles. However, information regarding the number of units refused is not recorded by Motor Pool personnel so we could not verify nor assess those instances when demand for vehicles exceeds fleet size.

There are other indications the Motor Pool fleet is not efficiently utilized. A review of annual vehicle mileage revealed 34 percent of the vehicles in the fleet had less than the national governmental fleet minimum of 16,500 miles driven. This minimum was determined by Runzheimer International (fleet management consultants). They compile data pertaining to governmental fleets. Utilization of sub-compacts, pick-up trucks, and vans appears to be lowest. For example, two sub-compact vehicles

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had less than 9,200 miles driven during a 12-month period. The following table illustrates the average annual miles driven per vehicle type.

| Table 7                                                        |                                                                            |
|----------------------------------------------------------------|----------------------------------------------------------------------------|
| <u>Average Annual Miles Per Vehicle Type*</u>                  |                                                                            |
| Fiscal Year 1990-91                                            |                                                                            |
| <u>Vehicle Type</u>                                            | <u>Average Annual Miles</u>                                                |
| 4x4 Utility                                                    | 22,839                                                                     |
| Sub-compact                                                    | 11,810                                                                     |
| Mid-size                                                       | 23,585                                                                     |
| Pick-up Truck                                                  | 15,046                                                                     |
| Vans                                                           | 14,333                                                                     |
| * Includes only rental vehicles available for entire 12 months |                                                                            |
| Source:                                                        | Compiled by the Office of the Legislative Auditor from department records. |

Visual observations of the Motor Pool's lot substantiate there are vehicles which sit idle. During May and June of 1991, which are higher use months, we found there was an average of 44 Motor Pool vehicles sitting idle.

There was also a daily average of 25 vehicles in fiscal year 1991-92 which were not available for use because they were listed as awaiting preventive maintenance or repairs. These vehicles represent 12 percent of the fleet which is idle waiting for shop service and also indicates excessive fleet size.

Excess vehicles result in increased operating and maintenance costs and therefore higher vehicle rental rates. A smaller fleet would be less costly to operate and maintain. In addition, with less equipment in the fleet, there would be less equipment to replace, thus saving capital outlay. There would be a one time savings of the purchase price of additional vehicles. We estimate the department could eliminate up to 30 vehicles at an average cost of \$10,700 each. MDT could save at least \$321,000 in

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future vehicle replacement costs if under-utilized vehicles were eliminated through attrition. Additional savings would result from reduced fixed costs associated with these extra vehicles. We estimate an annual savings of \$64,200 in fixed vehicle costs. These savings are expressed in current dollars.

Further, low usage vehicles are kept for a longer period of time until they reach the end of economic life. This increases the age of the fleet and could result in reduced resale value of these vehicles. Older vehicles generally require more repairs which could increase the variable cost of operation.

It appears there are several factors which have contributed to excess vehicles in the Motor Pool fleet: 1) the department does not adhere to established methodology for analyzing and calculating target fleet size, 2) staff are not trained in analyzing fleet use, 3) department management overestimated increased fleet use during fiscal years 1988-89 and 1989-90 and increased fleet size dramatically, and 4) department management is reluctant to reduce fleet size.

### Methodology for Determining Fleet Size

Although the department has established an informal methodology for assessing fleet use and establishing optimal fleet size, department management and staff do not adhere to it. Management indicated analyzing Motor Pool fleet size and use has not been a priority item. As a result, fleet use and size are not reviewed and adjusted annually. In addition, the lack of documented methodology for analyzing vehicle use and determining optimal fleet size allows for variance from established procedures and misinterpretation of methodology. Department management has also made the decision to maintain fleet size above optimal at all times.

We also found the department's informal fleet assessment methodology does not consider usage by vehicle type. Rather, it examines usage of the motor pool fleet as a whole. Review of average annual mileage per vehicle type indicated utilization varies greatly. For example, mid-size vehicles are used twice as much as sub-compacts. Thus, assessing fleet use as a whole makes it difficult to accurately determine the number and types of motor pool vehicles needed.

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### **Staff Training**

There are two staff directly involved in the analysis of Motor Pool fleet use. We found related training has not been provided to these staff. Staff responsible for analysis of fleet usage need additional statistical training to fully understand the analysis and its implications.

### **MDT Increased Fleet Size Too Much**

Department data indicates use of the Motor Pool fleet increased during fiscal years 1985-86, 1986-87 and 1987-88, with a large increase in use during fiscal year 1987-88. As a result of increased use, MDT management projected use would continue to increase during fiscal years 1988-89 and 1989-90. Thus, they decided to increase the number of vehicles in the fleet to a figure larger than optimal fleet size. In actuality, the average number of vehicles used dropped by 36 percent even though total miles traveled increased slightly during fiscal years 1988-89 and 1989-90. In addition, MDT continued to increase fleet size during fiscal years 1990-91 and 1991-92 which compounded the situation. The department has not adjusted the fleet to correspond with actual use.

### **Reluctance to Reduce Fleet Size**

Management is reluctant to reduce fleet size because, should an increase in usage occur, this would necessitate an increase in fleet size. MDT management indicate fleet reduction is simple to accomplish; however, increasing fleet size is difficult. Previously, the Motor Pool Program was able to borrow funds from the Highway Reconstruction Trust Fund (RTF) to accomplish purchase of additional vehicles. Management states RTF fund shortages have made this avenue for a short term loan nearly impossible. Proper planning based on past usage increases should eliminate the need for such loans.

### **Summary**

Our review revealed the Motor Pool fleet is larger than necessary to satisfy current user demand. A number of vehicles are not fully utilized and sit idle. Recently, the department increased usage by leasing an additional 15 vehicles to state agencies. The net effect of this change is an increase in optimal fleet size of five vehicles. However, Motor Pool fleet still exceeds optimal size.

We believe the department should analyze vehicle usage and adjust the size of the fleet to more appropriately reflect vehicle

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use. This issue was also identified in the 1982 performance audit of the state Motor Pool (81-17M). In addition, the department should establish a documented methodology for analyzing fleet use and determining optimal fleet size. This analysis should be conducted on an annual basis. This would ensure Motor Pool utilization data is current and fleet size remains at an appropriate level. The department should also conduct the analysis of usage by vehicle type (rather than the fleet as a whole) which could be used to "fine tune" fleet structure and provide a more appropriate number of vehicles. Providing training to persons responsible for assessing use and fleet size would also improve the analysis.

Current methodology computes monthly average use, averages these figures to determine annual average use and sets target size based upon this annual figure. Department staff have recently considered several different methodologies to assess vehicle use and set optimal fleet size. Options include: 1) computing monthly target fleet size and averaging these figures to set annual target fleet size, and 2) computing annual daily usage and target fleet size. Some of these options yield more accurate results than others. We believe the department should base the analysis on average annual daily fleet usage rather than average monthly fleet usage. This would provide a more accurate indicator of fleet use and optimal fleet size. Accuracy increases as the number of statistical observations (number of days of use data) increases. The department currently gathers daily fleet usage data so incorporating this methodology is feasible.

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### Recommendation #8

We recommend the department:

- A. Establish a documented methodology for analyzing fleet use and determining optimal fleet size which incorporates an annual analysis, average annual daily usage and analysis of vehicle type.
- B. Analyze fleet usage and adjust the size of the Motor Pool fleet to a level consistent with the computed optimal size.
- C. Provide applicable staff with appropriate training for conducting fleet size analysis.

### **Motor Pool Rental Rates**

The current rate structure for rental of vehicles in the Motor Pool fleet consists of a per mile rate and a flat minimum daily charge. This charge is designed to recover both fixed and variable costs of fleet operations. There are separate rental rates for each of the five classes (types) of vehicles in the fleet. The following table illustrates the current rates per mile charged for each vehicle class.

Table 8

Fiscal Year 1991-92 Motor Pool Rental Rates

| <u>Type of Vehicle</u> | <u>Rate Per Mile</u> |
|------------------------|----------------------|
| Sub-compact            | \$0.2030             |
| Pick-up Truck          | 0.2189               |
| Mid-size               | 0.2256               |
| 4x4 Utility            | 0.2609               |
| Van                    | 0.3181               |

Source: Compiled by the Office of the Legislative Auditor from department records.

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The rate structure should ensure users pay a rate which reimburses the department for those costs associated with operating a particular type of vehicle.

During our audit we reviewed fleet rental rates to determine if rates appropriately recover associated costs. We found rental rates for the 4x4 utility vehicles have not recovered costs for a period of four fiscal years, 1988-89 through 1991-92. As of March 1992, revenue shortfall for utility vehicles is at least \$30,000.

As a result of the inadequate rate, users of 4x4 utility vehicles have not paid a proportionate share of the costs associated with these vehicles. The under collection, in effect, decreased the Motor Pool Program working capital by a similar amount. This will affect future funding requirements for all users.

Department management is aware of the revenue shortfall for 4x4 utility vehicles. They indicate the shortage could have occurred for a number of reasons including decreased usage and an increased number of 4x4 utility vehicles. The department raised rental rates for these vehicles during fiscal years 1989-90 and 1990-91. However, these increased rates still did not recover associated vehicle costs. In spite of the continuing revenue shortfall, the department lowered rental rates in fiscal 1991-92.

The department should ensure rental rates for 4x4 utility vehicles are set at an appropriate level. The department agrees rental rates for this vehicle type should be adjusted.

### Recommendation #9

We recommend the department adjust the rental rates for 4x4 utility vehicles to fully recover associated costs.

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### Lease Vehicles

In addition to the fleet of rental vehicles, the Motor Pool also leases vehicles to agencies for various periods of time. Vehicle leasing fluctuates greatly over the course of a year and peaks during the summer months. During fiscal years 1990-91 and 1991-92, there were an average of 41 vehicles leased to various agencies. The Motor Pool has established criteria for the assignment and monitoring of lease vehicles. Criteria provide for the establishment of lease rates based on an individual vehicle basis and include minimum vehicle usage requirements. Department criteria also requires monitoring of rates and usage to ensure lease requirements are met and costs recovered.

There are three different lease vehicle rate structures. Lease rates are generally developed using a split rate structure which recovers fixed costs in the form of a monthly charge and variable costs, including vehicle replacement, in the form of a per mile charge. Lease vehicles incurring high mileage are charged a straight per mile rate. The Motor Pool Program also has a few vehicles with high odometer readings which are leased to agencies for short distance trips. The lessee is assessed a flat monthly charge for these vehicles.

Agencies leasing vehicles are required to maintain, on a quarterly basis, 80 percent of the mileage of a comparable class of vehicles in the Motor Pool fleet. Leases are to be terminated on all vehicles that fail to meet the minimum mileage requirements.

We identified several areas where documentation, review and monitoring of vehicle leases could be improved. The following sections discuss these issues.

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### Lease Vehicle Documentation

The department's documentation of vehicle leases generally consists of a lease agreement (Inter-agency Service Agreement) which details vehicle assignment and terms of the lease; and a lease rate work-sheet which documents how a lease rate was established.

We reviewed vehicle leases for fiscal year 1991-92 to determine adequacy of related documentation. We found inadequate

## Chapter IV - Motor Pool Program

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documentation of vehicle lease assignments and rates. Ten percent (4/41) of vehicle leases were established without a lease agreement. These vehicles were leased to the Department of Fish, Wildlife and Parks and the Department of Transportation. In addition, it was difficult to ascertain when vehicle lease periods began and ended for all 41 leases. We also found 56 percent (23/41) of lease files did not contain lease rate work sheets of how individual lease rates were established. For those leases that did have a lease rate work sheet, we found 15 percent of them had adjustments made to the rates agencies were assessed without documentation which substantiated the adjustment. In addition, for those lease files that did contain a lease rate work sheet, we could not determine which time period's operating cost information was used to establish the lease rate. We also found limited documentation justifying selection of which of three rate structures were used to recover leased vehicle costs (split rate, straight mileage, fixed monthly).

Inadequate documentation makes it difficult to determine how lease rates are set and impedes monitoring of vehicle expenses and adjustment of rates. This could prevent proper recovery of vehicle costs and result in excess revenue or revenue loss as explained in the next section.

Poorly documented leases also make it difficult to track lease vehicle assignments. We noted instances when Motor Pool staff were uncertain how many vehicles were leased and who the agencies were.

Inconsistencies in lease vehicle file contents occurred because there are no standardized documentation procedures for vehicle leases. Different staff members are involved in assigning lease vehicles and determining lease rates. Documentation procedures vary considerably among staff.

Properly documented leases will aid staff in monitoring lease vehicle assignment and rates to ensure lease requirements are met and costs recovered.

### Recommendation #10

We recommend the department adopt procedures to ensure lease files adequately document vehicle assignments and support lease rates.

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#### Monitoring of Lease Vehicle Costs, Rates, and Use

The current rate structure for lease vehicles is designed to recover actual costs incurred on a vehicle-by-vehicle basis. Monitoring of each vehicle's costs and usage is necessary so adjustments can be made to the lease rate as costs may vary from those used in original rate calculations. Department policies require vehicle usage and lease rates to be monitored, and adjusted as necessary, on a quarterly basis.

We reviewed the extent of monitoring taking place and lease rate changes made to ensure recovery of lease costs for a judgmental sample of 12 lease vehicles. We found the Motor Pool had not monitored any of the 12 vehicles or made any lease rate changes during the time period reviewed. Upon discussion with Motor Pool staff, it was determined that periodic monitoring of leased vehicles had not been done for 1 1/2 to 2 years.

In order to determine if the lack of monitoring had a detrimental effect on lease vehicle revenues, we reviewed lease vehicle operating costs for the same sample of 12 vehicles to determine if lease rates were appropriate. Although the methodology used to establish initial lease rates would recover costs if applied, we found lessees are not always charged the proper rate for their lease and as a result, the lease system is not equitable.

The lack of periodic monitoring of leased vehicle costs and revenues, and adjustment of lease rates has caused revenue shortfalls for some leased vehicles and excessive revenue collection for others. An evaluation of operating cost history (acquisition to present) for the twelve leased vehicles revealed costs were not recovered for 83 percent (10/12) of the leased vehicles reviewed

## Chapter IV - Motor Pool Program

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in our sample. This resulted in a revenue shortfall of \$14,642 as of December 31, 1991. In addition, we noted two vehicles for which the lease rate appeared to be excessive as revenues exceeded costs by \$4,504 for the same period. This results in a net loss of vehicle lease revenues totalling \$10,138. These costs would be borne by other regular Motor Pool users.

We also reviewed monitoring of lease vehicle use to determine if minimum usage requirements were met. We found no evidence the department monitors use. Since documentation pertaining to vehicle leases is inadequate, we could not review lease vehicle use. Discussions with staff revealed the quarterly monitoring reviews have not been conducted as other duties take priority. The staff have not taken the time to monitor vehicle usage and costs, and adjust lease rates where applicable. As a result, lease vehicle costs may not be recovered.

Periodic monitoring of leased vehicle expenses and rates would ensure recovery of vehicle costs. In addition, examination of use would assist in assuring leased vehicles are efficiently used.

### Recommendation #11

**We recommend the department periodically monitor leased vehicle expenditures, revenues, and use, and adjust rates as needed to ensure each vehicle's costs are recovered and rates remain appropriate.**

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### **Motor Pool Management Information**

Management information which is properly developed and maintained is essential for providing effective control of an organization. Information pertaining to equipment fleets can assist management in preserving the investment in the fleet and ensure efficient and economical use. According to a survey by Runzhiemer International (fleet management consultant), costs associated with maintenance and repair have been key problems facing managers of government fleets. To control rising fleet costs, a management information system should provide

## Chapter IV - Motor Pool Program

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management with accurate information to allow monitoring of vehicle usage, service, preventive maintenance, and repair history.

During our audit we reviewed management information used in administering Motor Pool operations. Information pertaining to fleet operations is compiled both manually and by a computerized information system, the Motor Pool Management System (MPMS).

We identified several areas where management information could be improved. The following sections discuss these issues.

---

### **Fleet Service, Preventive Maintenance, and Repair Information**

The Motor Pool has two systems for recording vehicle service, maintenance and repair information – a manual system and an automated system. The manual system involves staff recording fleet service information (Level I) basic service on two separate forms: 1) vehicle service sticker (visor sticker), and 2) vehicle maintenance schedule and record book (blue book). In addition, preventive maintenance (Level II) and other vehicle repairs are recorded in the: 1) vehicle maintenance schedule and record book, 2) maintenance log, and 3) shop job order. Fleet service and preventive maintenance are also recorded on an automated system, the MPMS. Staff indicate primary reliance is placed upon the vehicle service sticker and blue book (manual system) for monitoring service and preventive maintenance.

We found neither the manual nor automated systems are working properly and information contained on them is incomplete and inaccurate. For instance, although information is consistently recorded on the vehicle service sticker, it is not always recorded in the vehicle maintenance schedule and record book, maintenance log, or shop job order. In addition, we found service and maintenance data are not always input on the MPMS. Fifty percent of the vehicles which we reviewed did not have the data properly recorded. We also noted an instance where recurring repairs to a vehicle's brake rotors were made, yet the maintenance log did not reflect all of these repairs.

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As a result of incomplete management information, Motor Pool management does not currently have an effective means for monitoring service, preventive maintenance and repair history. This has caused inadequate fleet preventive maintenance and makes it difficult to identify recurring repair problems. Incomplete information also limits the effectiveness of the MPMS as a management tool.

Motor Pool staff believe they can effectively monitor service and preventive maintenance through the use of vehicle service stickers and vehicle maintenance schedule and record books. However, since this information is kept in individual vehicles, service and maintenance history is not readily available when the vehicles are in use. Thus, staff can not adequately consider maintenance needs when scheduling vehicles for future trips. In addition, we observed instances where vehicle maintenance schedule and record books were misplaced, resulting in lost service and preventive maintenance history for those vehicles.

Although staff are aware of the proper procedures for recording fleet service, maintenance, and repair information, they do not always follow the procedures correctly. There is no management monitoring to ensure data is properly and accurately recorded.

We believe the department should monitor fleet service, preventive maintenance and repairs. This would ensure fleet maintenance information is recorded consistently and accurately. The department should review management reports produced by the MPMS to ensure data is reliable and fleet maintenance performed.

### Recommendation #12

We recommend the department:

- A. Record fleet service, preventive maintenance, and repair information in a consistent and accurate manner on all appropriate records and MPMS.
- B. Review and monitor MPMS management reports to ensure service, preventive maintenance and repair data is correct and necessary work completed.

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### **Preventive Maintenance Program Summary Report**

The MPMS produces a Preventive Maintenance Program Summary report (MPMS 06) which identifies when vehicles should be scheduled for service and preventive maintenance and also identifies vehicles for which service and preventive maintenance is past due. We found the criteria used for this program is incorrect. Motor Pool procedures require all classes of vehicles to be serviced at 5,000 mile intervals and preventive maintenance be done at 20,000 mile intervals. The Preventive Maintenance Program Summary report uses criteria of 3,000 miles for service and 15,000 miles for preventive maintenance for three of five classes of vehicles. Therefore, the report incorrectly identifies vehicles as needing or past due for service and preventive maintenance. This discrepancy was caused by a programming error.

As a result of the inadequacies identified with this management report, Motor Pool staff do not use the report to monitor fleet service and preventive maintenance. This, combined with the lack of a reliable central source of maintenance data, causes staff to rely on the manual monitoring of vehicle service stickers which are not readily available to Motor Pool staff.

In order to assist staff in monitoring Motor Pool fleet maintenance, the department should update criteria used in the Preventive Maintenance Program Summary Report.

## Chapter IV - Motor Pool Program

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### Recommendation #13

We recommend the department update the service and preventive maintenance criteria used to produce the Preventive Maintenance Program Summary report.

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#### Use of Management Information System

The Motor Pool Management Information System (MPMS), which is used to manage fleet operations, provides information pertaining to operating costs, inventory, maintenance, fleet use, production, and equipment replacement. This system produces a number of reports which are distributed to department officials and Motor Pool staff.

During the audit we identified a number of concerns pertaining to information produced by the MPMS. We found there are numerous reports produced by MPMS which are either not used nor fully used by staff. Staff indicated a number of reports were not used including the Fuel Summary Report (MPMS 05), Sub-standard Unit Report (MPMS 04), Fleet Assignment by Class Report (MPMS 03), Motor Pool Repair System PM & Service Mileage Update Report (MPMS 07), and Repair and Fleet Summary Report (MPMS 02). Some of these reports are not needed or may not be the best means for monitoring Motor Pool operations.

Discussions with staff also indicated staff were not fully aware of how management reports should be used and expressed a reluctance in using them. In addition, we found reports are not always distributed to appropriate staff. For example, the MPMS produces a report listing repair call-backs for Motor Pool vehicles (MPMS 01). The Motor Pool manager does not receive this report yet it could be used to monitor repeat repairs to vehicles and could supplement the manual record system currently used by the manager.

## **Chapter IV - Motor Pool Program**

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As a result of these concerns, the Motor Pool Management System is not used to its full potential. This makes it difficult for management and staff to fully assess Motor Pool performance or to determine whether the fleet is properly maintained and used.

It appears there are a number of causes that contribute to the inadequacies of the MPMS. As previously discussed, we found fleet maintenance data recorded on the system to be incomplete and therefore unreliable. As a result, staff do not use some reports produced by the MPMS. Staff also have not received formal training regarding use of the MPMS nor does a users manual exist. Finally, the system has not been formally reviewed by the department since implementation in 1984.

Our review indicated the department would benefit by reassessing the MPMS to ensure it meets the needs of Motor Pool management and staff and produces relevant data. Also, proper distribution of related reports would assist with managing operations. In addition, staff training would provide staff with an understanding of concepts of the system and how information produced by the MPMS can be used in daily operations of the Motor Pool. Lastly, a users manual would provide staff with additional information to assist with use of the management system.

### **Recommendation #14**

**We recommend the department:**

- A. Review the Motor Pool Management System to determine if the system produces pertinent data.**
- B. Ensure management information is distributed to appropriate staff, and staff are trained on proper use of such information.**
- C. Develop a MPMS users manual.**

## Chapter IV - Motor Pool Program

### Fleet Maintenance

Proper vehicle maintenance is necessary to ensure safe and cost effective Motor Pool fleet operations. The department's Equipment Maintenance Manual states, "Fleet maintenance is the systematic care, servicing and inspection of equipment to ensure a serviceable condition and to detect and correct failures before they become major repairs. Fleet maintenance also extends the serviceable life of equipment." The department has established policies for completion of maintenance for passenger vehicles which require Level I (basic service) to be performed at 5,000 mile intervals and Level II (preventive maintenance) at 20,000 mile intervals. Since it is unrealistic for service and preventive maintenance to be performed precisely at the specified intervals, informal policy allows for a variation of plus or minus 10 percent.

We reviewed fleet maintenance to determine if maintenance is conducted according to department policy. Level I and Level II maintenance history was reviewed for a sample of 34 Motor Pool vehicles which included both rental and lease vehicles. We found that Level I and II maintenance is not always completed on rental fleet and leased vehicles according to department policy as shown by the following table.

| Table 9                               |                                                                            |
|---------------------------------------|----------------------------------------------------------------------------|
| <u>Timeliness of Motor Pool Fleet</u> |                                                                            |
| <u>Level I and II Maintenance</u>     |                                                                            |
| <u>Rental Fleet</u>                   |                                                                            |
| * 23% of Level I at least 10% late    |                                                                            |
| * 27% of Level II at least 10% late   |                                                                            |
| <u>Leased Fleet</u>                   |                                                                            |
| * 17% of Level I at least 10% late    |                                                                            |
| * 39% of Level I at least 10% early   |                                                                            |
| * 33% of Level II at least 10% early  |                                                                            |
| Source:                               | Compiled by the Office of the Legislative Auditor from department records. |

The exceptions found included two rental fleet vehicles which had accumulated 6,400 miles between Level I maintenance and one vehicle with 26,000 miles between Level II maintenance. A

total of 56 percent of leased vehicle Level I maintenance was done too soon or too late (differing from department criteria by at least 10 percent). In addition, 33 percent of Level II maintenance was done too soon on leased vehicles. The vehicles reviewed included one leased vehicle which was serviced after 144 miles had elapsed since the last Level I service and another vehicle after 450 miles.

There are a number of factors affecting timely servicing and maintenance of the Motor Pool fleet. Primarily, staff are unable to adequately monitor fleet maintenance as service and preventive maintenance information is not readily available and is often incomplete and inaccurate. Inaccurate recording and reporting of maintenance related information is discussed on page 61. Once the maintenance information has been improved, as discussed in the preceding section, the Motor Pool staff should be better able to improve monitoring of the timeliness of service and preventive maintenance.

Regarding inappropriate servicing of leased Motor Pool vehicles, we found Motor Pool staff do not follow the department's established criteria for servicing leased vehicles. Rather than servicing these vehicles based on mileage, leased vehicles are serviced by Motor Pool staff when the oil appears dirty.

Some of the problems noted related to leased Motor Pool vehicles result from unclear policy regarding who is responsible for providing and monitoring service to leased vehicles. Some leased vehicles are maintained by the lessee while Motor Pool maintains others. Further, vehicle maintenance is sometimes monitored by Motor Pool staff, while other times staff indicated they rely on the lessee to monitor vehicle maintenance needs. Both Motor Pool staff and lessees were uncertain as to who is responsible for leased vehicle maintenance. It appears this situation is not consistent with the Inter-agency Service Agreement (lease agreement) which specifically states, "The Motor Pool will be responsible for all normal maintenance performed on a regularly scheduled basis." However, the agreement needs to specify who is responsible for monitoring maintenance and intervals at which Level I and II service will be conducted.

## **Chapter IV - Motor Pool Program**

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Untimely service and preventive maintenance could detrimentally affect vehicle condition. In addition, undetected mechanical problems can cause increased repairs, downtime and operating costs, and increased vehicle safety concerns. Unnecessary service also results in increased maintenance expenses.

We believe the department can improve Motor Pool operations by improving monitoring of maintenance activity, and communicating policy regarding maintenance of leased Motor Pool cars.

### **Recommendation #15**

**We recommend the department:**

- A. Monitor Motor Pool rental fleet maintenance to ensure service and preventive maintenance is conducted in a timely manner and in accordance with established department criteria.**
- B. Establish who is responsible for providing and monitoring leased vehicle service and preventive maintenance.**

---

## **Policies and Procedures**

Specific program policies and procedures guide personnel in performing duties in a consistent and accurate manner. Established policies and procedures also strengthen management's control over program operations and help to assure continuity of services as staffing changes occur.

Motor Pool operations are managed in an informal manner. We found limited documented guidance available to staff. Staff members also expressed frustration with the informal means of receiving policy changes. Although there are three manuals (Motor Pool Operations Manual, Equipment Management System Manual, and Motor Pool rules and regulations) which management indicates are available to staff for guidance, none of these manuals are specific to the operation of the Motor Pool. Even though the Motor Pool Operations Manual contains

## Chapter IV - Motor Pool Program

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examples of forms, instructions for form completion, and some limited procedures specific to dispatching, servicing, and other operational duties; this manual is not current and does not adequately document program procedures.

During audit work we noted many examples where formalized policies were needed, including:

- \* methodology for analyzing fleet use and determining optimal fleet size;
- \* procedures for establishing lease agreements and rates;
- \* recording of vehicle servicing data; and
- \* fleet maintenance procedures.

Lack of formal policies and procedures has caused inconsistencies in operations and has impeded efficiency and effectiveness of Motor Pool staff. For example, we noted inconsistencies in the methods used to establish lease vehicle rates. This has resulted in an inequitable lease system. In addition, the informal structure of operations may have contributed to resources not being utilized in the most economical manner. This is evidenced in our finding regarding the excess Motor Pool fleet size.

Program officials indicate formal policies have not been developed because of the small size of Motor Pool operations. It was their belief that informal communication and existing manuals were sufficient to the needs of Motor Pool operations.

Many of the identified inconsistencies could be addressed by developing specific policies and procedures. The department should develop and distribute policies and procedures to Motor Pool management and staff.

### **Recommendation #16**

**We recommend the department develop specific Motor Pool operational policies and procedures.**



## **Agency Response**

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June 9, 1992

Scott A. Seacat  
Legislative Auditor  
Room 135  
State Capitol  
Helena, MT 59620

Subject: Department of Transportation's Performance Audit  
of Equipment and Motor Pool Operations

I am transmitting our response to the audit performed by  
your office for the subject operations.

Thank you for your staff's effort and cooperation during  
this audit.

If you have questions concerning our response, please call  
me at 444-6201.

A handwritten signature in black ink, appearing to read 'John Rothwell', written over a horizontal line.

John Rothwell  
Director of Transportation

## Recommendation #1

We recommend the department:

A. Review and revise the Equipment Management System to ensure it meets established objectives and provides useful, accurate, and timely management information.

B. Establish appropriate controls over data input, processing and output.

C. Provide appropriate training to ensure staff understand how to use the Equipment Management System.

## Response

Concur.

Issues identified during the EDP audit, report number 89DP-37, will be resolved as per the responses in that report.

Primary problem areas identified in this report appear to pertain to documenting and tracking actual hours or miles when Level 1 services are performed; no designated location on the EMS-1 usage document to list actual hours or miles when a Level 1 service is performed; inaccurate and untimely EMS reports (mostly dealing with the Level 1 services); effectiveness of EMS reports; and EMS training.

During the annual shop superintendent meeting on May 27 and 28, 1992, these issues were addressed. Decisions reached during the meeting are as follows:

1. Level 1 services will be tracked via a PC program, administered locally, based on actual hour meter hours or miles when the service was performed. The data can be entered locally and reports run daily, weekly or at the discretion of the shop superintendent. This should resolve timeliness and accuracy in Level 1 service reporting and monitoring.
2. A memorandum of instruction will be issued by the Maintenance and Equipment Bureau requiring the date and actual hour meter hours or odometer mileage to be entered in the remarks section of the EMS-1 document each time a Level-1 service is performed. The form will still be submitted bi-weekly, but each service will be precisely documented.
3. An informal information needs assessment will be conducted to determine elimination or revision of

EMS reports to better reflect current information needs.

4. A training program will be developed to explain the changes and revisions to the Equipment Management System and will incorporate an explanation of the system purpose.
5. Items 1 through 3 above will be accomplished on or before December 31, 1992. Item number 4 will be accomplished on or before July 1, 1993.

#### Recommendation #2

We recommend the department:

- A. Increase direct input from MDT field staff during the equipment selection process.
- B. Explain equipment selection decisions directly to field staff.

#### Response

Concur.

The need for field operations to have vehicles and equipment that meet functional requirements is recognized. It must also be recognized that department goals and objectives sometimes predicate the type and quantity of units that will be purchased. Competing equipment needs must be satisfied to the extent possible within available funding.

The department changed the decision making format of the Equipment Planning and Evaluation Committee for their meeting of April 22 and 23, 1992. The purpose of the meeting was to develop the '95 biennium equipment replacement schedule. The changes in the format allowed field personnel to develop the replacement schedule with Maintenance and Equipment Bureau personnel serving in an advisory capacity.

Equipment selections will be discussed with management personnel at regularly scheduled meetings and with employees that attend annual safety seminars.

#### Recommendation #3

We recommend the department:

- A. Develop and implement a formal equipment testing process.
- B. Formally document all equipment test results.

## Response

Partially concur.

The department does not have the staff, facilities or resources to conduct extensive statewide testing and research on every piece of equipment prior to placement in service. Additionally, equipment that performs in the most severe climates in the state (primarily western Montana) historically performs satisfactorily in the other areas of the state. Also, every attempt is made to acquire equipment that has been researched and tested either by other states or by private industry. Only under exceptional circumstances, when potential cost savings outweigh the anticipated development problems, will the department engage in a testing or research program.

The department will develop a semi-formal procedure to better document its limited equipment testing efforts on or before December 31, 1992.

## Recommendation #4

We recommend the department:

- A. Implement changes to decrease the amount of time between receipt of new equipment and in-service dates.
- B. Improve monitoring of the equipment purchase and fabrication process to ensure timely processing of new equipment.

## Response

Concur.

The department is currently utilizing additional, temporary, personnel to expedite the fabrication process and is reviewing the purchase/fabrication schedule to overcome previous problems. Additionally, it is implementing a new software scheduling system to better match resources to equipment receipt dates. Also, to enhance the fabrication schedule, the department has arranged for separate deliveries from the two successful vendors of the FY93 truck bid. The department will attempt to stagger deliveries in future purchases as long as the low bidder is agreeable and the department does not incur a significant price increase. The new computer scheduling system should be operational by October 1992. Fabrication of the FY92 dump trucks will be completed prior to receipt of the FY93 trucks.

#### Recommendation #5

We recommend the department develop procedures to monitor equipment preventative maintenance to ensure compliance with department policy.

#### Response

Concur.

The timeliness and accuracy of Level-1 service reporting, and subsequent monitoring, should be improved with adoption of the corrective measures delineated in Recommendation #1 above. The Level-1 and Level-2 service requirements will be updated by December 31, 1992 to conform to the new service intervals.

#### Recommendation #6

We recommend the department:

- A. Establish specific documented goals and objectives for the equipment program.
- B. Conduct periodic reviews to determine attainment of goals and objectives.

#### Response

Concur.

The department will establish specific goals and objectives for the equipment program on or before September 1, 1992.

#### Recommendation #7

We recommend the department develop a comprehensive training program.

#### Response

Generally concur.

On a number of occasions in the past the department has requested budget authority to enhance overall department training. In all instances, the requested budget increases for training was disapproved either by the budget office or the legislature.

A consultant conducted a maintenance and equipment training needs analysis in 1991. A training officer, dedicated specifically to maintenance and equipment training, was hired in the Organizational Development Bureau earlier this

year. The department will develop and implement maintenance and equipment training to the extent possible with current limited resources.

#### Recommendation #8

We recommend the department:

- A. Establish a documented methodology for analyzing fleet use and determining optimal fleet size which incorporates an annual analysis, average annual daily usage and analysis of vehicle type.
- B. Analyze fleet usage and adjust the size of the motor pool fleet to a level consistent with the computed optimal size.
- C. Provide applicable staff with appropriate training for conducting fleet size analysis.

#### Response

Generally concur.

The department agrees that a methodology for determining optimal fleet size and composition is necessary and that adjustments to fleet size and composition should be timely; however, past experience indicates that annual adjustments to fleet size only adjust the fleet to what's been experienced and, outside of several specific years where use remained constant, do not effectively predict increases and decreases in motor pool use. Since funding to increase motor pool fleet size has only been available during general legislative sessions, it is a disservice to motor pool users to wait two to three years to realize a needed fleet size increase.

Another issue is the constant requests from other agencies to lease more vehicles for statewide assignment. The department would have to double the size of Motor Pool to accommodate current requests. An EPP request for 20 additional lease vehicles in the '95 biennium has been submitted.

The department will develop a formal procedure to evaluate fleet size and composition on a timely basis that minimizes idle vehicles yet provides an adequate service to using agencies on or before September 1, 1992. Motor Pool personnel will be trained in the use of procedure.

It is the departments opinion that satisfying both users and auditors is a paradoxical task. An effort will be made to accomplish the most for both parties.

#### Recommendation #9

We recommend the department adjust the rental rates for 4x4 utility vehicles to fully recover associated costs.

#### Response

Concur.

The department currently recovers all associated costs, by class, for Motor Pool vehicles. All financial aspects of a given vehicle class must be considered to evaluate a gain or loss. A management information report reflects a loss for 4x4 utility vehicles; however, when all financial information is considered, the 4x4's did not incur a loss. Since this audit was not a financial audit, the entire financial side was not reviewed.

A revision to rental rate reporting procedures is presently being considered. Adoption of these concepts would enhance consistency between management information and accounting reports. If approved by the MDT Administration Division and OBPP, they will be implemented at the start of a fiscal year. Either FY93 or FY94.

#### Recommendation #10

We recommend the department adopt procedures to ensure lease files adequately document vehicle assignments and support lease rates.

#### Response

Concur.

The department will revise current procedures on or before September 1, 1992.

#### Recommendation #11

We recommend the department periodically monitor leased vehicle expenditures, revenues, and use, and adjust rates as needed to ensure each vehicle's costs are recovered and rates remain appropriate.

#### Response

Concur.

The entire concept of leasing motor pool vehicles will be reviewed. Rate establishment methods, policies and procedures, minimum use requirements and monitoring will all be addressed as part of the review. Revisions will be completed on or before December 31, 1992.

#### Recommendation #12

We recommend the department:

- A. Record fleet service, preventative maintenance, and repair information in a consistent and accurate manner on all appropriate records and MPMS.
- B. Review and monitor MPMS management reports to ensure service, preventative maintenance and repair data is correct and necessary work completed.

#### Response

Concur.

The department will review, revise and monitor record keeping procedures and management information reports so they reflect accurate information. Revisions will be completed by December 31, 1992.

#### Recommendation #13

We recommend the department update the service and preventative maintenance criteria used to produce the Preventive Maintenance Program Summary report.

#### Response

Concur.

The department will update the criteria on or before September 1, 1992.

#### Recommendation #14

We recommend the department:

- A. Review the Motor Pool Management System to determine if the system produces pertinent data.
- B. Ensure management information is distributed to appropriate staff, and staff are trained on proper use of such information.
- C. Develop a MPMS users manual.

#### Response

During the review of reports as delineated under Recommendation #12, an informal information needs assessment will be done to satisfy A above on or before December 31, 1992.

Appropriate personnel will be trained on the revisions as per B above on or before July 1, 1993.

An MPMS users manual will be developed on or before July 1, 1993.

#### Recommendation #15

We recommend the department:

- A. Monitor Motor Pool rental fleet maintenance to ensure service and preventative maintenance is conducted in a timely manner and in accordance with established department criteria.
- B. Establish who is responsible for providing and monitoring leased vehicle service and preventive maintenance.

#### Response

Concur.

These issues will be addressed at the same time as the review of the entire lease concept denoted under Recommendation #11.

#### Recommendation #16

We recommend the department develop specific Motor Pool operational policies and procedures.

#### Response

The department will develop specific Motor Pool operation policies and procedures and include them in the MPMS users manual denoted under Recommendation #14. This will be accomplished on or before July 1993.



## **Appendix A - Active Equipment Inventory**



## Appendix A - Active Equipment Inventory

### Montana Department of Transportation

#### Active Equipment Inventory

(Data as of December 1, 1991)

| <u>Vehicle<br/>Class</u> | <u>Total Pieces</u> | <u>Description</u>          |
|--------------------------|---------------------|-----------------------------|
| 00                       | 16                  | GVW pursuit car             |
| 02                       | 45                  | Bronco utility vehicle      |
| 03                       | 98                  | Suburban                    |
| 06                       | 70                  | Passenger car               |
| 07                       | 335                 | 1/2 ton pickup              |
| 08                       | 54                  | 3/4 ton pickup              |
| 09                       | 121                 | 1 ton utility truck         |
| 10                       | 13                  | 6 passenger vehicle         |
| 12                       | 34                  | Van                         |
| 19                       | 398                 | Dump truck (single-axle)    |
| 21                       | 25                  | 5th wheel truck             |
| 22                       | 7                   | Miscellaneous carrier truck |
| 23                       | 13                  | Paint Striper               |
| 5                        | 34                  | Special 4X4 truck           |
| 27                       | 56                  | Dump truck                  |
| 29                       | 99                  | Dump truck (tandem-axle)    |
| 30                       | 114                 | Motor patrol                |
| 31                       | 86                  | Roller                      |
| 32                       | 235                 | Loader                      |
| 33                       | 141                 | Mower                       |
| 34                       | 18                  | Special equipment           |
| 35                       | 9                   | Crawler tractor             |
| 36                       | 6                   | Miscellaneous equipment     |
| 37                       | 10                  | Pulverizer                  |
| 39                       | 31                  | Core drill earth auger      |
| 41                       | 26                  | Air compressor              |
| 42                       | 73                  | Broom                       |
| 44                       | 2                   | Support equipment           |
| 50                       | 337                 | One-way plow                |
| 51                       | 334                 | Reversible plow             |
| 53                       | 43                  | V-plow                      |
| 54                       | 32                  | Snow blower                 |
| 57                       | 553                 | Sander                      |
| 61                       | 219                 | Trailer                     |
| 62                       | 185                 | Distributor                 |
| 63                       | 97                  | Asphalt equipment           |
| 64                       | 129                 | Trailer house               |
| 65                       | 1                   | Crusher                     |
|                          | <u>4,099</u>        |                             |

Source: Compiled by the Office of the Legislative Auditor from department records.





